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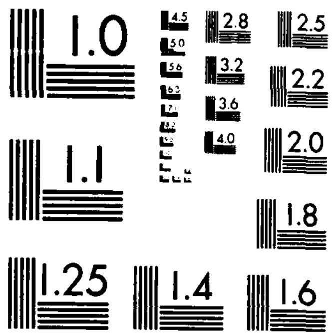
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NAVAL POSTGRADUATE SCHOOL

Monterey, California

MIZLANT 86 DATA REPORT
RESULTS OF AN OCEANOGRAPHIC CRUISE
TO NORTHERN BAFFIN BAY AND NARES STRAIT
IN SEPTEMBER 1986

Robert H. Bourke, Robert G. Paquette
and Victor G. Addison, Jr.

April 1988

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Naval Ocean Systems Center
San Diego, CA 92152

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Monterey, California

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Salinity and temperature measurements were made at 145 oceanographic stations in northern Baffin Bay and the waters to the north as far as the southern fringes of the Lincoln Sea. Intermediate water from the West Spitzbergen Current is shown to turn westward and enter Lancaster Sound, being walled off from entering Smith Sound to any great degree by bathymetry. Intermediate water from the Arctic Ocean flows southward, the deeper and warmer parts truncated by a sill in Kennedy Channel.

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RESULTS OF AN OCEANOGRAPHIC CRUISE

TO NORTHERN BAFFIN BAY AND NARES STRAIT

IN SEPTEMBER 1986

by

Robert H. Bourke, Robert G. Paquette and Victor G. Addison,Jr.

I. INTRODUCTION

During September 1986, aboard the Canadian ice breaker CCGS SIR JOHN FRANKLIN, scientists from the Naval Postgraduate School, the Arctic Submarine Laboratory, Bedford Institute and the Polar Research Laboratory carried out an oceanographic and bathymetric measurement program from Baffin Bay northward into Smith Sound, Kane Basin, Kennedy Channel and Robeson Channel (the latter four collectively known as Nares Strait), reaching the southern fringes of the Lincoln Sea at latitude 82° - 09'N. A bathymetric chart of the area is shown as Figure 1 and the station positions as Figure 2. In the present discussion we shall use the name Smith Sound to include the basin to the south although most maps seem to apply the name only to the passage between this basin and Kane Basin. This cruise makes the most northerly penetration of an oceanographic ship since the 1971 cruise of the CCGS LOUIS S. ST. LAURENT.

The principal objectives of the cruise were to characterize the water masses and circulation in northern Baffin Bay and Nares Strait and to conduct a bathymetric survey of Nares Strait. Specific objectives were to

1. Establish the nature of the westward turning of the West Greenland Current as it recirculates in northern Baffin Bay to join the Baffin Current.
2. Conduct circulation and water mass analyses to determine the relation of the Atlantic Water in the northern reaches of Nares Strait with that found in the West Greenland Current.
3. Describe the characteristics of the waters of Nares Strait, since so few oceanographic observations have been made in its northern reaches.
4. Examine the baroclinic circulation at the entrances to Smith, Jones and Lancaster Sounds to assess the contributions of these flows to the circulation and water budget of northern Baffin Bay.

The results of the bathymetric survey have been reported in a preliminary cruise report (Bourke, 1986) and will not be further discussed here. A detailed analysis of the physical oceanographic data relative to the above objectives has recently been completed by Addison (1987).

The present report briefly sketches the major cruise statistics and findings. It includes, as Appendix A, a list of stations and ancillary data. Appendix B includes a complete set of plots of temperature, salinity, sound speed and sigma-t versus depth for each station occupied.

1. Prior Work

Previous investigations up to 1970 are summarized by Muench (1971) and the cruise of WESTWIND 1970 is described by Muench (1972). These data were taken with reversing bottles, except for WESTWIND 1969 and WESTWIND 1970 in which the Bisset-Berman STD was used. In all, between 1916 and 1970 about 680 stations have been occupied in 22 different cruises in northern Baffin Bay, Smith Sound, Kane Basin and the mouths of Lancaster Sound and Jones Sound. Since 1970, little oceanographic measurement has been done north of 75°N.

2. Narrative.

The cruise, designated AE86, took place on a Canadian icebreaker because of Canadian objections to the passage of a U. S. icebreaker through some of the channels of the Canadian Archipelago. This caused some equipment problems which are summarized in the next section.

The scientific personnel consisted of the following persons.

Professor Robert H. Bourke, Naval Postgraduate School,
NPS, Chief Scientist

Lt. Alan M. Weigel, USN,

Lt. Victor G. Addison, USN, NPS

Mr. Patrick Barthelow, NPS

Dr. Edward Floyd, Arctic Submarine Laboratory, Naval
Ocean Systems Center, San Diego (NOSC)

Dr. Burton Markham, NOSC

Mr. Robert K. Perry, NOSC, bathymetrist

Mr. Kim O. McCoy, Polar Research Laboratory, Santa Barbara

Dr. E. Peter Jones, Bedford Institute of Oceanography, Halifax

The scientific party met in Montreal, Canada on 5 September 1986 and flew to Resolute Bay on Cornwallis I. to join the ship. The ship was underway on 6 September heading for the first station at the mouth of Lancaster Sound. After occupying a line of stations across the mouth of Lancaster Sound, the ship proceeded northward to do the same at the mouth of Jones Sound. Then the ship occupied 21 stations in Smith Sound, 47 in Kane Basin and 15 stations along Kennedy and Robeson Channels. On the return south, 22 more stations were occupied and the cruise was terminated with 3 lines, 26 stations, in Melville Bay on 26 September. A total of 145 stations were occupied, not counting a 25-hour time series at the southern end of Kennedy Channel at Station 115. Simultaneous with the CTD time series was a series of direct current measurements with a Hydro Products current meter recording on deck. Neither of these time series has seen more than a cursory analysis to date.

II. INSTRUMENTATION

Since the icebreaker was not equipped with a winch for scientific equipment the Neil Brown CTD could not be used. Instead, three Applied Micro Systems Ltd. Model STD-12 CTD's were used. This is an internallly recording CTD in which the data from a lowering is dumped into an IBM PC-compatible computer for further processing, recording and display. A battery-powered winch and synthetic fiber line were used for lowering the instrument.

The instrument has a stated accuracy of 0.02 milliSiemens/cm (0.020 mmho/cm) in electrical conductivity, 0.01°C. in temperature and no stated accuracy in depth. The resolutions were stated to be 0.003 mS/cm, 0.001°C and 0.05 dbar, respectively. Although the stated accuracy in salinity is 0.01, the accuracy derivable from the conductivity and temperature accuracies is nearer 0.02 in salinity at low temperatures.

The response constants for temperature and conductivity are not stated. Empirically it was found that constants of 0.058 sec in temperature and 0.02 sec in conductivity produced a reasonable unscrambling of the loops in the temperature-salinity diagram during despiking. These loops occur characteristically when sharp temperature transients are recorded with an instrument in which the lags of the two sensors are not matched.

The data were recorded internally in coded binary form and then were read off, after a lowering, into a Compaq computer for conversion into engineering units. The translated results were written to 5.25-in floppy diskettes. The instrument was programmed to sample the data stream every 0.8 dbar of pressure change, up or down. Significantly finer resolution in pressure, although desired, was not convenient because of computer memory limitations in the deeper lowerings and the long time required to download the CTD data to the computer.

The data stream was sampled for time, pressure, temperature and conductivity during 0.125 sec. Thus, a significant response error was generated also from the non-simultaneity of sampling.

There were three instruments involved: Numbers 422, 433 and 467. No. 433 is the property of the Naval Postgraduate School (NPS) and was calibrated at 20 temperatures in the range 0.2 to 12.4°C both before and after the cruise. Conductivity was calibrated at 5 points between 42 and 55 mS/cm, unfortunately with none of the lower

values characteristic of the low-temperature Arctic waters. Pressure was calibrated at 12 points between 0 and 690 dbar.

Calibrations for the other two instruments were not available initially. They finally were calibrated by intercomparison with No. 433 on a number of lowerings made with the three instruments together on the same line. A number of comparisons were attempted with the salinity samples from a Niskin bottle (without thermometers) clamped to the lowering wire just above the CTD on a number of lowerings. The latter comparisons were not useful for high accuracy standardization because the salinity gradients both in time and in space were so large, at the depths available, that the two techniques were not sampling effectively the same water.

The calibration technique finally used is described as follows. The after-cruise calibrations of No. 433 were expressed as first-degree polynomials in the variable concerned and accepted. In the case of conductivity, in which the data did not extend to zero conductivity, the least-squares fit was forced to include a point near the origin which was changed by trial until the error of fit was minimized.

The pressures on the two other meters were calibrated by noting the pressure offset when crossing the water surface to obtain the constant term in the equation. Then, on simultaneous lowerings, the first-degree term was derived by comparison of the pressures at the bottom of the lowering with the corrected pressure from 433. These pressure calibrations then were applied to the simultaneous lowerings and tables of temperature and conductivy were generated every 20 decibars of pressure. Differences from 433 were calculated and these differences were fitted to a first-degree equation. One equation, tentatively judged to be the most reliable, was chosen for each variable for Meters 422 and 467 and recomputed to an absolute basis rather than relative to 433.

Finally, all the results of simultaneous lowerings were checked, using the tentative calibrations, by plotting them as temperature-conductivity diagrams and overlaying

the diagrams on a light table. This technique has the advantages of ignoring depth errors and instant-of-sampling errors and it averages over a large number of points. The curves were gratifyingly similar and only minor adjustments, mostly in conductivity, were necessary. It should be noted that there were enough irregularities in the curves that unique fits could be obtained by overlaying. As a result, the temperature and conductivity offsets could be satisfactorily distinguished. The several lowerings were consistent and it is believed that the relative accuracies between the meters is better than 0.01 mS/cm and 0.01°C.

To these errors there must be added (in an r.m.s. sense) the errors in the laboratory calibration of 433, which are about 0.003°C and 0.007 mS/cm. Presently, no information is at hand to assess any possible effect of environmental temperatures in the field on the electronics. Exclusive of such effects, it is concluded that the absolute error in the variables is smaller than 0.02°C. and 0.02 mS/cm. This would make the r.m.s. error in salinity about 0.03.

Interestingly, the overlaying of temperature-conductivity diagrams also provided a way of checking the pressure calibrations. Points selected every 20 dbars were plotted on the curves. Failure of these points to coincide indicated pressure errors. In one case the pressure calibration was refined by this technique. It is believed that the pressures are accurate within two decibars.

Editing was by means of the programs used heretofore for the Neil Brown Instrument Systems (NBIS) CTD. These programs were modified slightly to accommodate several data characteristics not found in the NBIS data.

The following editing was performed.

1. Gross errors, if any, were removed.

2. Top of lowering and bottom of lowering anomalies and repetitions were removed, automatically if the anomalies were large, manually if they were too small to be trusted to an automatic screening.

3. Depth reversals were eliminated.

4. Obvious bad spots in the data were eliminated by interpolation.

5. The temperature and conductivity were corrected for the effects of sensor lag ("despiking").

6. The despiked conductivities were smoothed with a 5-point centered running mean.

7. All the derived variables were computed.

After the first editing, temperature-salinity diagrams were plotted for all the stations and anomalies were corrected by repeating parts of the editing procedure, usually with the elimination of one or more bad points from the original data. In 5 cases, where ice apparently had formed in the conductivity cell, it was necessary to accept the upward traverse in order to get a satisfactory data set. In a few cases the response constants for the despiking operation were changed on the assumption that the lowering speed had been significantly changed.

The edited data are relatively free of anomalies, but not perfect, particularly because the despiking process is not perfect and the rate of lowering is variable and only approximately known.

All the station data were successfully recovered from the floppy diskettes except for Station 64 which had complications preventing final editing and recalculation.

Both up and down profiles were obtained at each station but only down profiles were retained, except for six stations (See Appendix 2) in which the up profile was judged more accurate. This generally occurred when flushing and soaking of the CTD failed to

completely remove any ice film frozen in the conductivity cell prior to lowering. The warmer water at deeper depths was always sufficient to melt this ice.

III. RESULTS

A detailed analysis of the cruise results is given by Addison (1987). The description which follows is abbreviated.

The major communications of northern Baffin Bay with waters to the south are the northward flowing West Greenland Current, having its origins in the East Greenland Current, and the southward flowing Baffin Current , which becomes the Labrador Current farther south. These circulations, as shown by Muench (1972) may be seen in Figure 3. Not apparent in this figure are cold water outflows from Smith, Jones and Lancaster Sounds. The circulation is shown in more detail in Figure 4, a map of surface dynamic topographies obtained from the present work.

The waters from the above three sounds also contain slightly warmer and more saline intermediate water at depth. There are two kinds of intermediate water, one propagating southward from the Arctic Ocean through Nares Strait, which we shall call Arctic Basin Intermediate Water (AB-IW). The other is contained in the West Greenland Current and is called West Greenland Current Intermediate Water (WGC-IW). This latter propagates northward to the southern entrance of Smith Sound and across northern Baffin Bay to enter Lancaster Sound.

The change of water properties northward may be seen in the south-to-north sections of Figures 5 and 6, which extend from northern Baffin Bay to the north end of

Robeson Channel. The upper layers north of the ice edge are typified by the lower temperatures and lower salinities due to melting ice. South of the ice edge, the effects of the ice become more diffuse. There is a deep-reaching perturbation of the water column near the ice edge, a phenomenon seen in various forms by several investigators (See, for example, Buckley et al., 1979; Paquette et al., 1985; Bourke, et al., 1987).

The action of the sill south of Station 89 in cutting off the more saline layers ($S > 34.5$) of the AB-IW is clear The colder but less saline, hence shallower, intermediate water propagates southward little changed to the southern reaches of Kane Basin. Here the more saline layers at the extreme bottom disappear. Continuing southward and following the 34.0 isohaline, little change in temperature is observed until the effect of WGC-IW is seen near the southern entrance to Smith Sound between Stations 22 and 28. This latter intermediate water is characterized by temperatures more than a degree C warmer than the AB-IW on, for example, the 34.0 isohaline.

Most of the WGC-IW appears to turn west towards Lancaster Sound, following the contours of Melville Bay and Cape York. A little farther northward, a west-to-east section extending from Jones Sound to Thule, Greenland (Figure 7) shows that the WGC-IW, now considerably cooled from the temperatures above 1°C observed farther south, is confined to the eastern channel. The shallow bathymetry near the Carey Islands (Figure 3) prevents further northward flow of the WGC-IW, shunting it instead to the west. The western channel near the entrance to Smith Sound in Figure 7 has maximum temperatures near bottom of -0.2°C, indicating that the intermediate water here is of the northern type.

The horizontal distribution of the intermediate waters is shown in Figure 8 as the temperature on the 34.0 salinity surface. The choice of this salinty surface is a compromise. Admittedly it is at a shallow enough depth to involve some modification by upper-layer water but it is purposely shallow enough so that a number of shallow

stations that otherwise would be unrepresented are included. The separation into three different regions, a northern, a southern and a transition water, is rather clean. The coldest water is sharply cut off by the sill south of Station 89; the warmest water is sharply limited by a line extending roughly ENE from Lancaster Sound, corresponding to an arc of shallow features in the bathymetry. In the central area of Kane Basin and Smith Sound the transitional intermediate water is warmer than that north of the sill but colder than would be expected from extensive mixing of the two parent water masses, indicating that the contribution of the WGC-IW is small compared to the AB-IW.

The characteristics of these several waters may be seen in the temperature-salinity diagrams of Figure 9. The close similarity of intermediate waters from the West Greenland Current (Sta. 122A) and the mouth of Lancaster Sound (Sta. 005) is clear. The West Greenland Current Intermediate Water, therefore, must move westward across the northern end of Baffin Bay into the deep eastern end of Lancaster Sound. The intermediate water at the north end of Robeson Channel (Sta. 096) is not only colder but also more saline than the waters to the south. The sill in Kennedy Channel cuts off this water mass at about the 34.5 isohaline. The modification this northern water receives farther south may be seen in the curve for Station 119 in the middle of Smith Sound.

The shallow ends of the curves in Figure 9 reflect mainly different climatic conditions and different concentrations of ice cover. In the extreme north, surface waters are near freezing whereas at the most southerly station, Station 122A, the temperature is nearly 1°C, but already showing the surficial cooling of autumn. The three more southerly curves show a temperature minimum at about 100 m depth. This is a relic of the previous winter's cooling being overcome by summer heating working downward from the surface.

It also appears that the surface water of northern Baffin Bay and the bodies of water to the north is somewhat more saline than surface water in the West Greenland Current. Whether this is due to dilution of the latter current while it was still the East Greenland Current or to a higher rate of addition of fresh water from the glaciers in the warmer climates of the more southerly parts of the region is presently unclear.

In summary, the more interesting aspects of the results are these.

1. There is a southward flow of Arctic Ocean water through Nares Strait to depths great enough to include the upper portions of the Arctic Basin Intermediate Water.

2. Intermediate water from the Arctic Basin suffers a truncation by a sill in Kennedy Channel.

3. Warmer intermediate water from the West Greenland Current enters the deeper portions of Lancaster Sound. This water enters Smith Sound only to a minor degree and is sharply delimited by shallow topographic features near the Carey Islands, severely restricting its advance into Smith Sound.

ACKNOWLEDGMENTS

The authors wish to express their gratitude for the help provided by the officers and crew of the Canadian icebreaker SIR JOHN FRANKLIN. This research was conducted under the cognizance of the Arctic Submarine Laboratory, Naval Ocean Systems Center, San Diego, CA and was funded by the Naval Postgraduate School.

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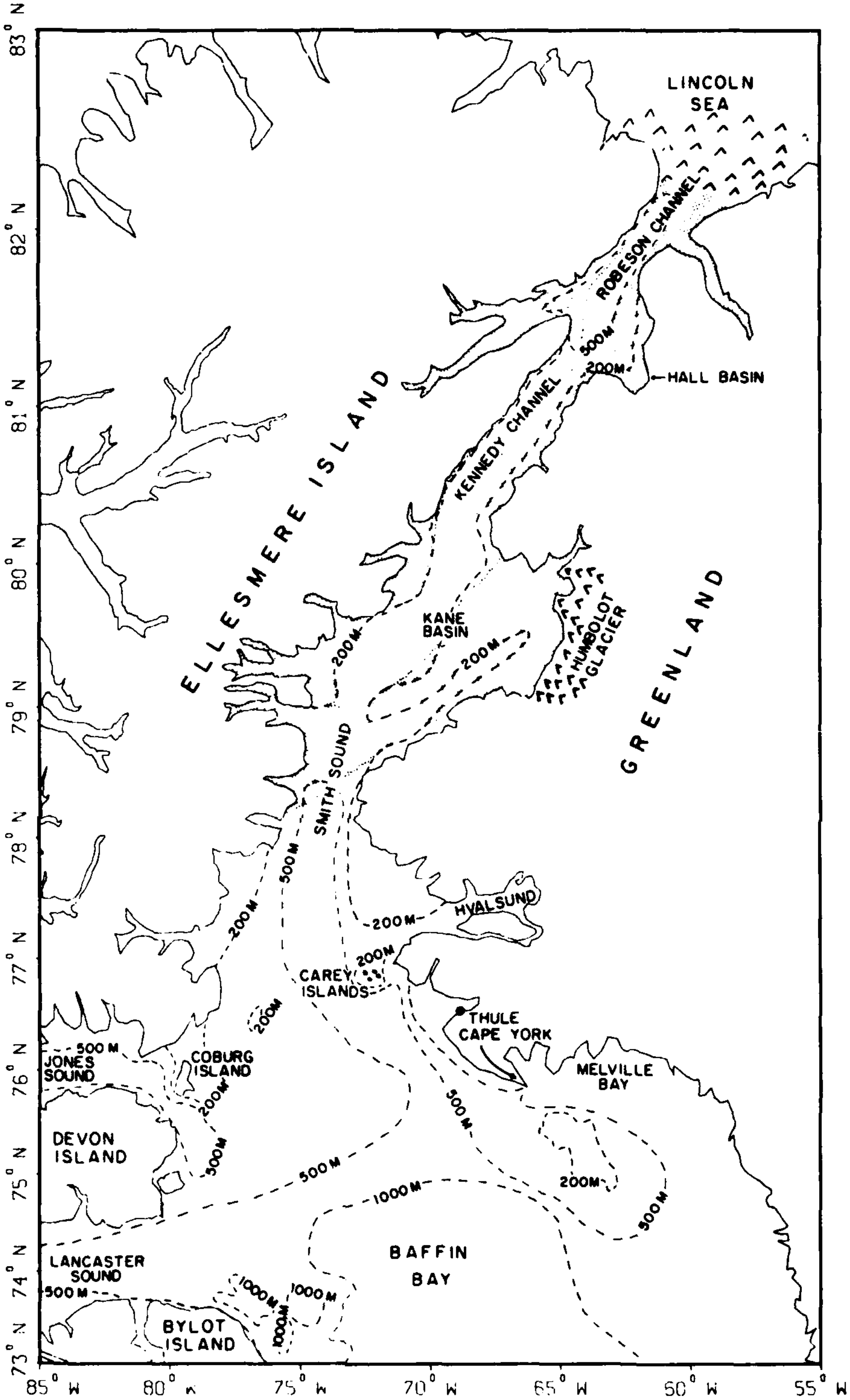

Figure 1. A chart of the northern Baffin Bay - Nares Strait region. Ice concentrations greater than 7/10 during the FRANKLIN 86 cruise are represented as shaded areas.

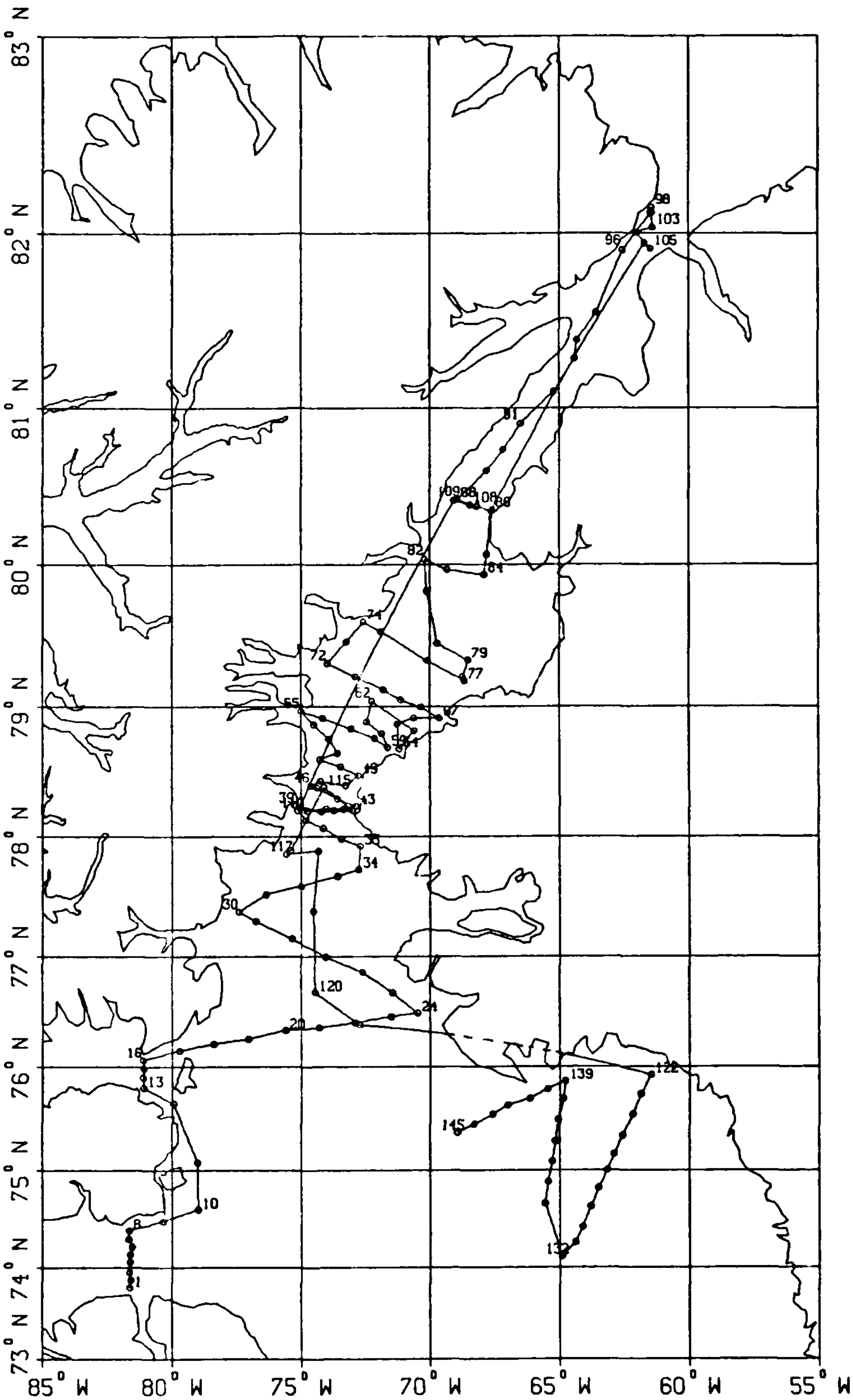

Figure 2. CTD station positions for the FRANKLIN 86 cruise.

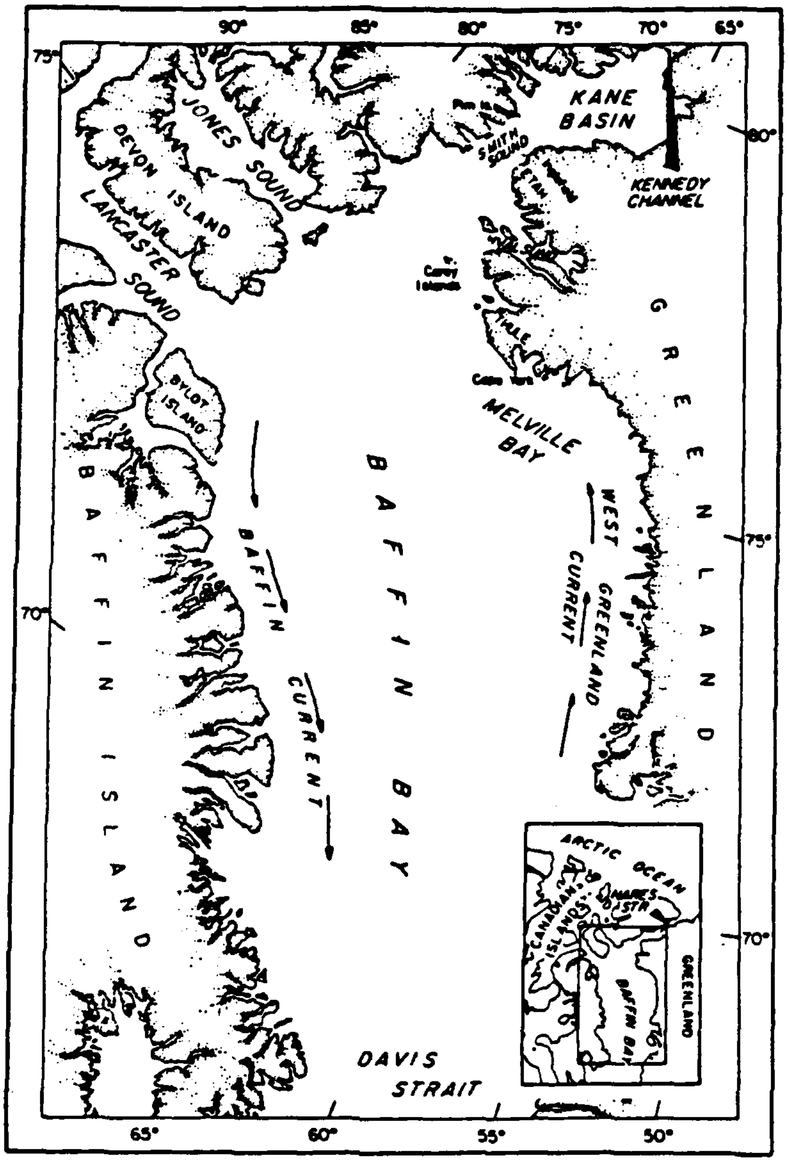

Figure 3. The classical circulation picture in Baffin Bay (from Muench, 1971).

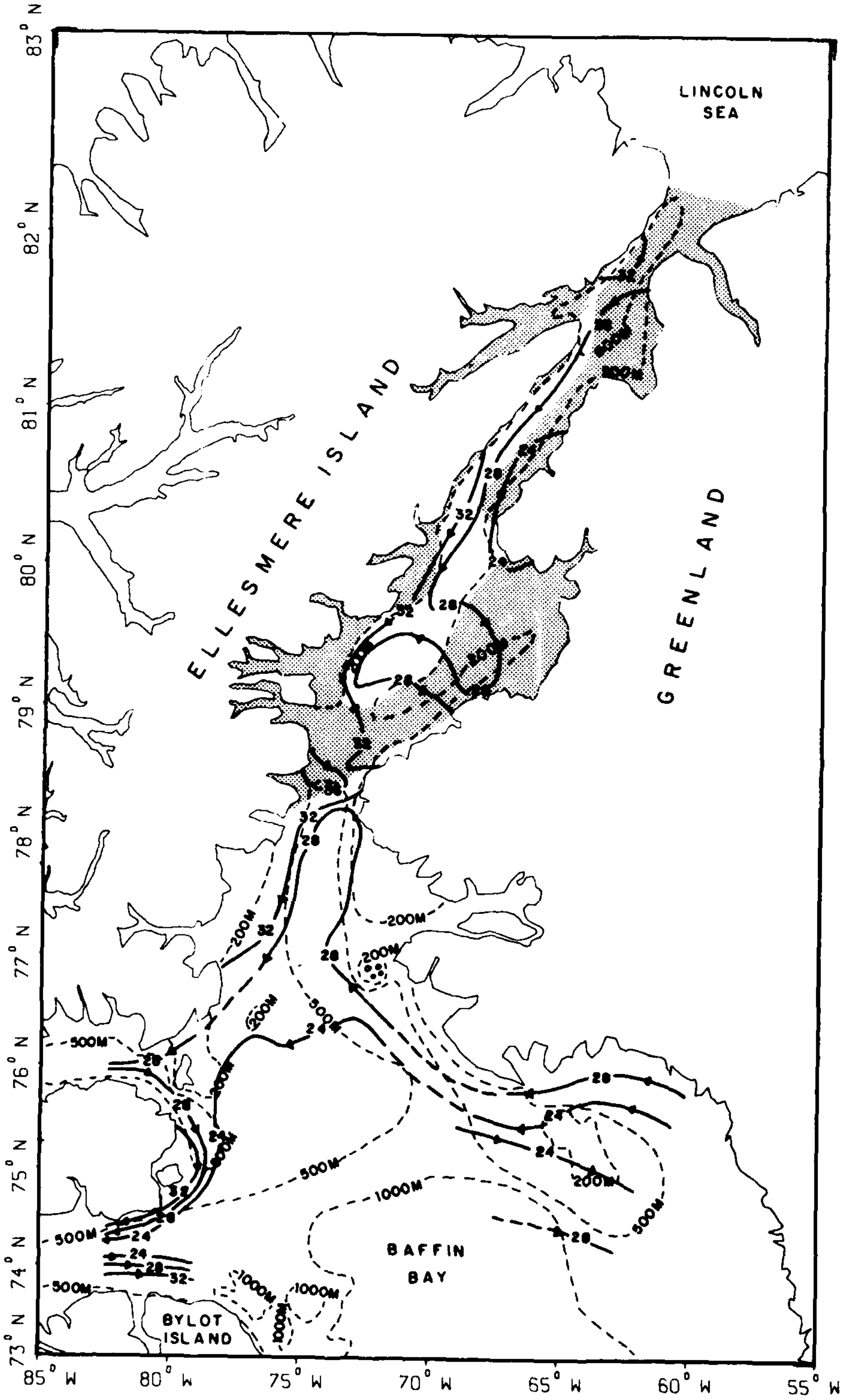

Figure 4. The surface dynamic topography relative to 200 decibars, in dynamic centimeters.

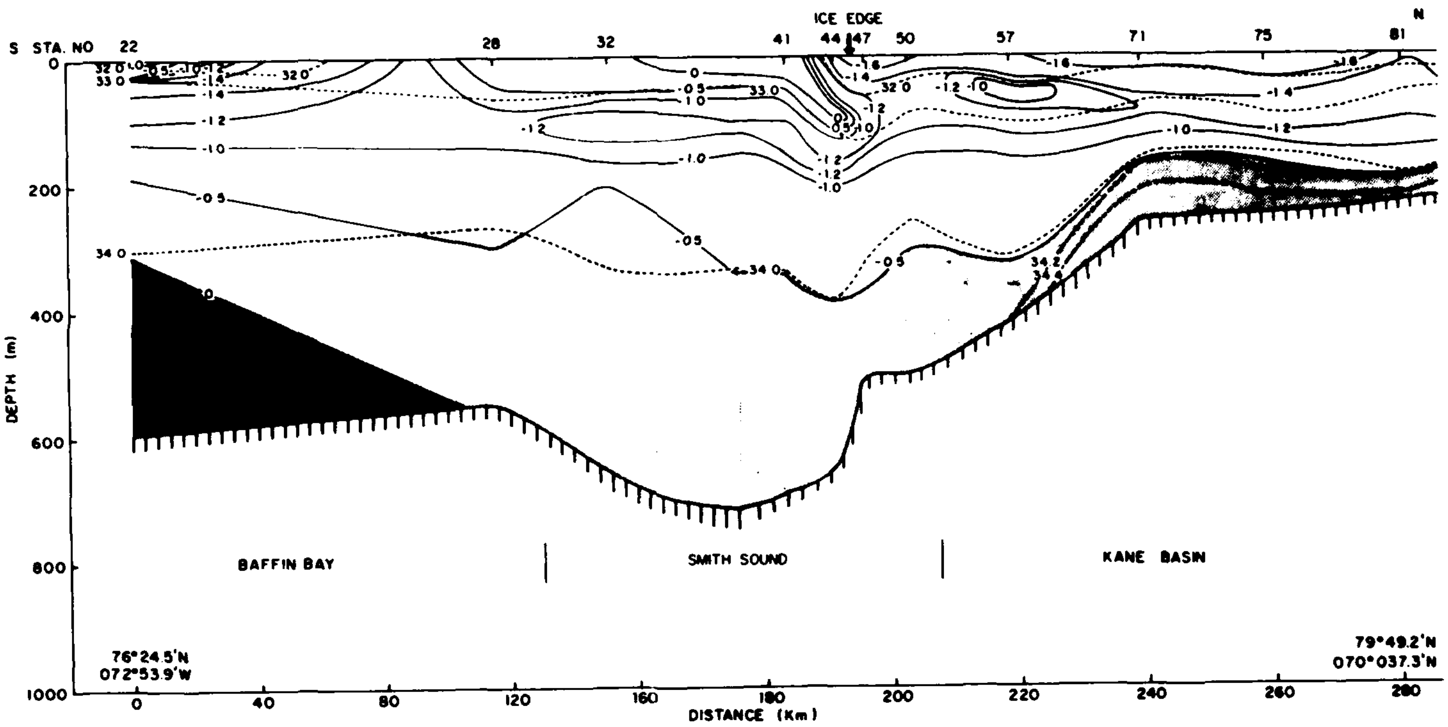

Figure 5. Temperature and salinity transect from Baffin Bay northward to Kane Basin. The northern intermediate water along the 34.0 isohaline changes little until the southern intermediate water (dark shading) exerts some influence between Stations 22 and 28. Perturbations of the water column by the ice edge are seen near Station 44.

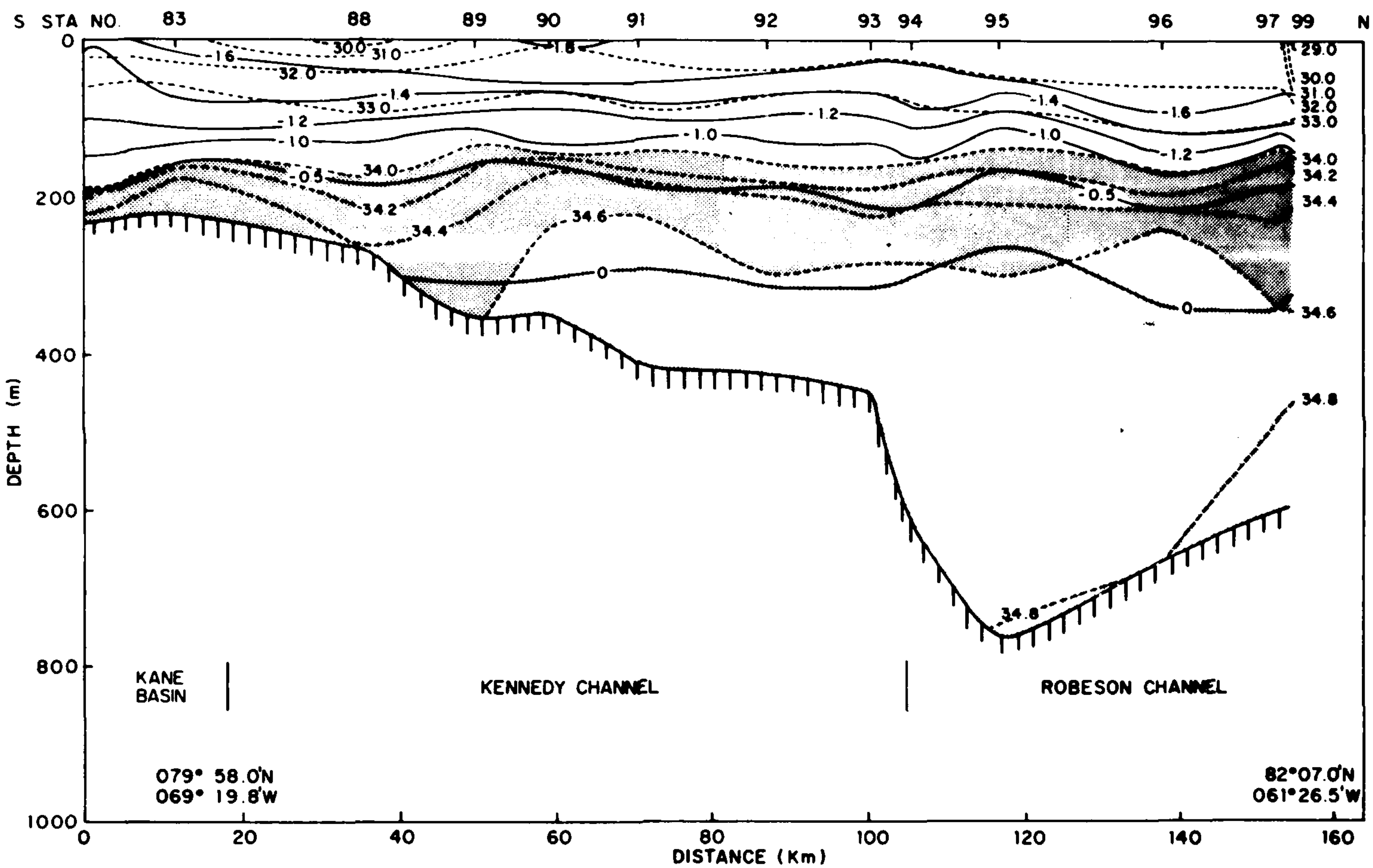

Figure 6. Temperature and salinity transect from Kane Basin northward to the north end of Robeson Channel. Arctic Ocean Intermediate Water more saline than 34.5 (light shading, contour not shown) is prevented from propagating farther southward in Nares Strait by the sill near Station 89.

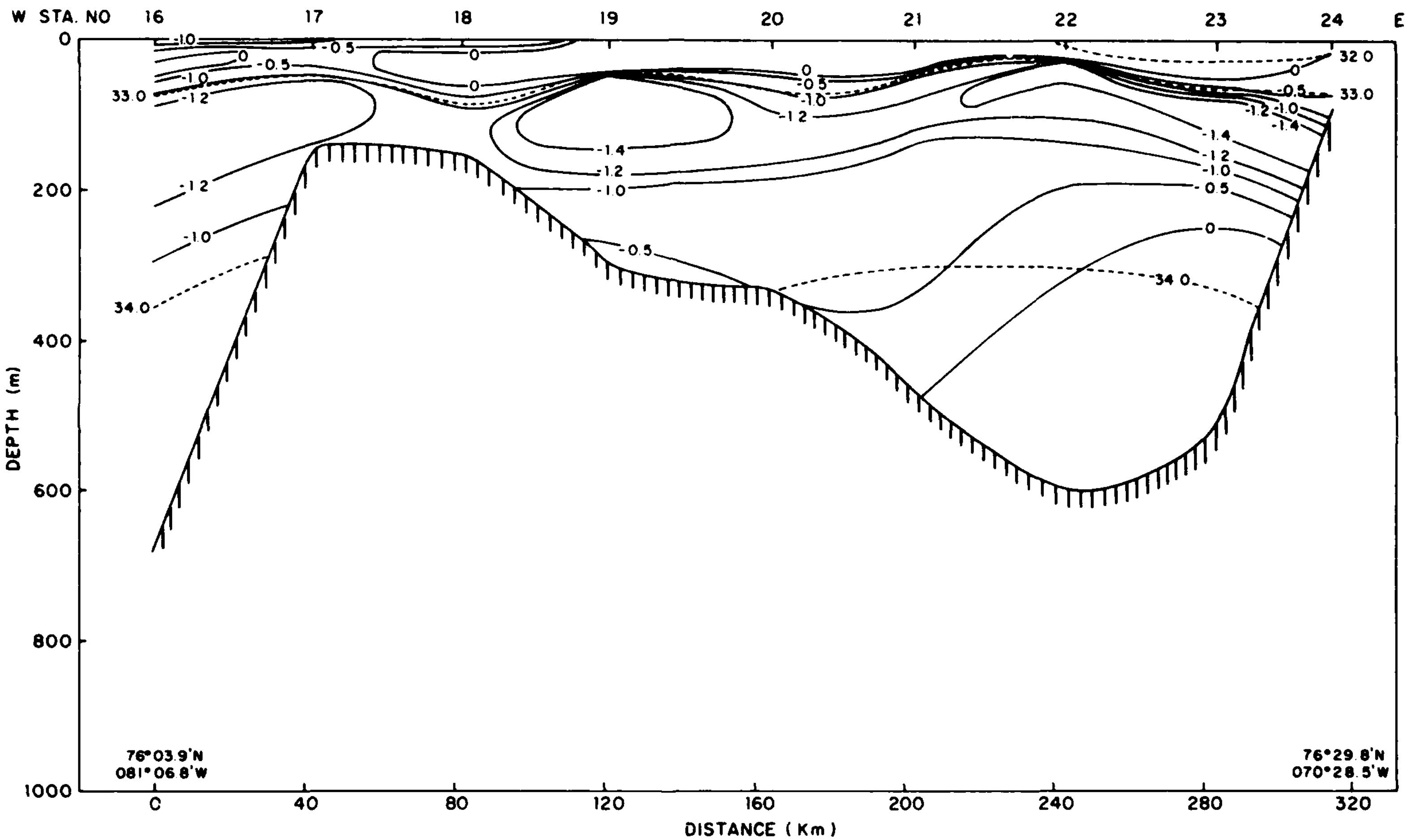

Figure 7. Temperature and salinity transect from Jones Sound to Thule. Intermediate Water of the southern type enters the east side of the eastern channel but is diverted to the west by the shallow bathymetry of the Carey Islands. Intermediate water of the northern type appears in the western channel near Jones Sound.

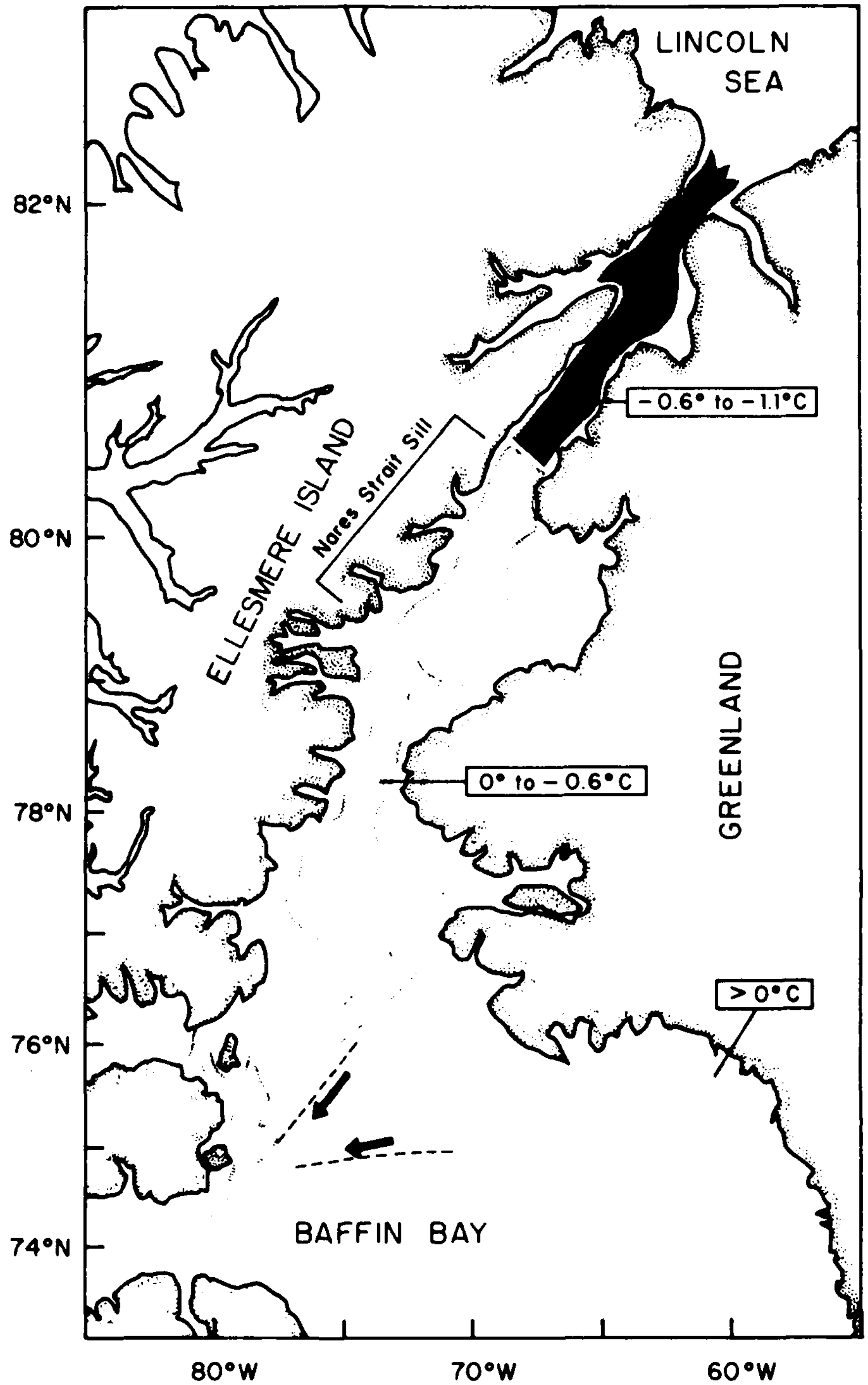

Figure 8. Areal distribution of Arctic Ocean Intermediate Water and West Greenland Current Intermediate Water and their admixtures, shown as temperature on the 34.0 salinity surface. Unshaded areas generally indicate shallow water or lack of data. Areas in northern Baffin Bay with shaded bars or arrows indicate a reasonable presumption of propagation of the southern water mass in spite of limited data.

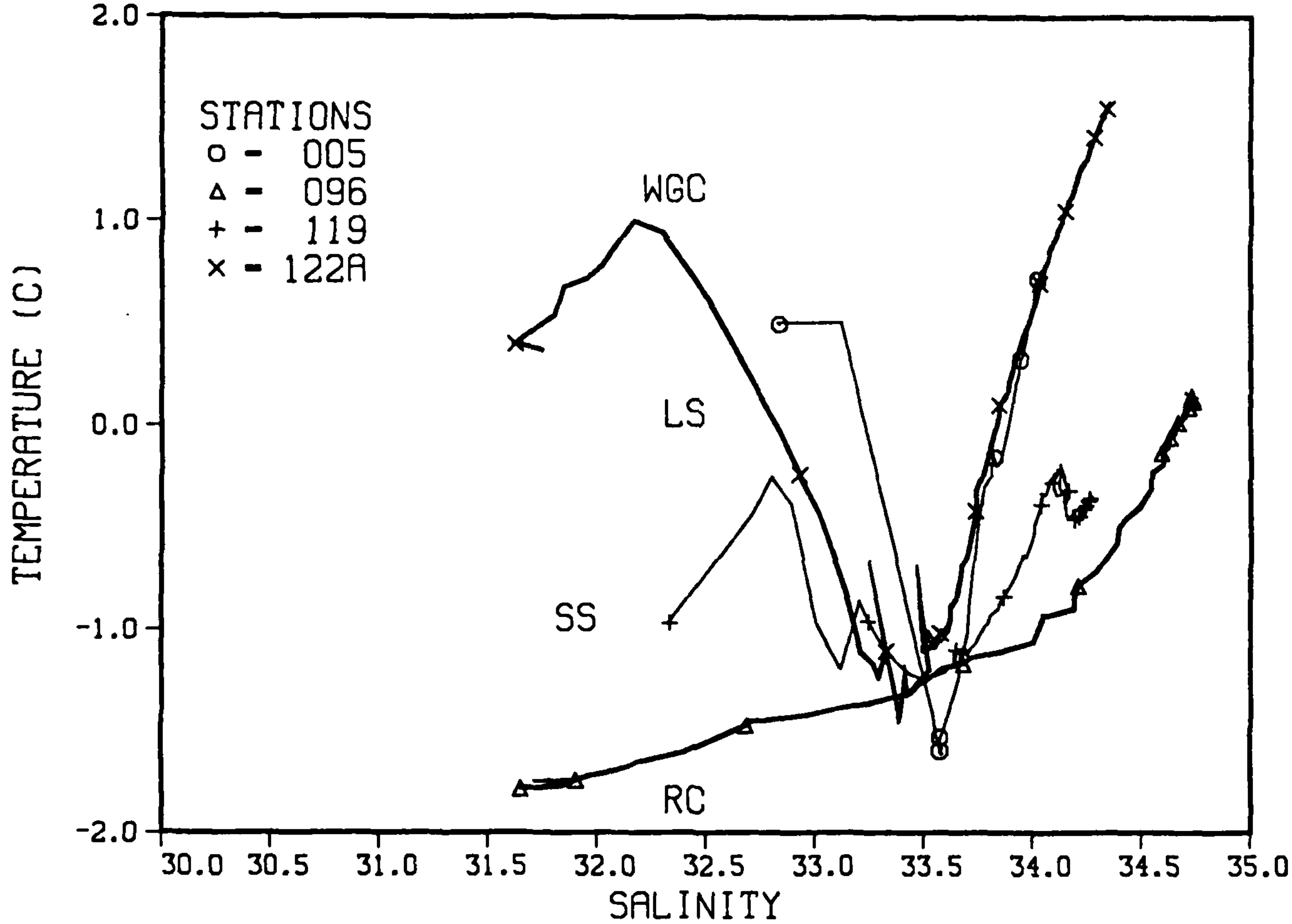

Figure 9. Temperature-salinity correlation for four stations illustrating the change of water properties from south to north and from east to west. Symbols are placed on the curves every 50 decibars of pressure. The close similarity of intermediate water in the West Greenland Current (WGC) and mouth of Lancaster Sound (LS) indicates propagation from the former to the latter. Intermediate Water in Smith Sound (SS) is a transitional fraction less saline than 34.4 and segregated from Arctic Basin Intermediate Water at the north end of Robeson Channel (RC) by a sill in Kennedy Channel.

APPENDIX A

Explanation of Heading Codes

The heading of the printed output uses the coding from NODC Publication M-2, August 1964, with a few exceptions. Heading entries which are not self-explanatory are as follows: MSQ is the Marsden square, and DPTH is the water depth in meters. Wave source direction (WVD) is in tens of degrees, but the direction 00 indicates calm seas due to ice dampening. The significant wave height is coded by Table 10 (code - 2 = height in meters). Wind speed, V, is coded as Beaufort force, Table 17. The barometer is in tenths of millibars, omitting the 900 or 1000 digit as appropriate; wet and dry bulb temperatures are in degrees C. The ice concentration, ICE, is in tenths; amounts less than one tenth are preceded by a minus sign and indicate concentrations in powers of ten, e.g., $10^{-4} = -4$.

The entry, NAV, is a code to identify the accuracy of each station position based upon the navigation system used. Code 1 indicates a position determined by visual sightings, radar or by navigation satellite; Code 2 a position determined by Omega or Loran; and Code 3 a position determined by dead reckoning. During MIZLANT 86 all station locations were determined by visual or radar sightings or by satellite navigation.

The heading data are listed sequentially with increasing station number.

STATION DATA MIZLANT 86 (ARCTIC EAST 1986)

NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N73-47.3	W081-36.5	261	09	07	86	12.0	1-	577	1	0	06	0	07	4	201	-01.4	-02.3
18	JF	N73-52.2	W081-35.5	261	09	07	86	13.5	2-	687	1	0	06	4	08	6	201	-01.4	-02.3
18	JF	N73-57.2	W081-38.5	261	09	07	86	15.0	3-	627	1	0	07	3	07	6	204	-01.0	-02.0
18	JF	N74-03.7	W081-36.5	261	09	07	86	17.0	4-	727	1	0	06	3	06	6	202	-01.1	-02.5
18	JF	N74-08.5	W081-37.0	261	09	07	86	18.7	5-	765	1	0	07	3	06	6	202	-01.0	-02.2
18	JF	N74-13.2	W081-32.1	261	09	07	86	20.1	6-	782	1	0	07	3	07	5	209	-01.2	-02.2
18	JF	N74-18.1	W081-40.0	261	09	07	86	21.3	7-	717	1	0	05	3	06	6	211	-01.0	-02.6
18	JF	N74-23.5	W081-33.2	261	09	07	86	22.8	8-	687	1	0	07	3	07	6	210	-01.1	-02.1
18	JF	N74-29.0	W080-20.8	261	09	08	86	01.7	9-	658	1	0	03	3	05	6	203	-01.5	-02.5
18	JF	N74-36.4	W078-58.6	260	09	08	86	04.7	10-	512	1	0	36	3	03	5	192	-01.5	-02.5
18	JF	N75-04.7	W079-00.3	260	09	08	86	08.8	11-	527	1	0	36	3	35	5	188	-02.5	-04.5
18	JF	N75-39.4	W079-57.0	260	09	08	86	17.0	12-	557	1	1	31	2	30	4	182	-03.5	-05.0
18	JF	N75-48.4	W081-06.0	261	09	08	86	19.4	13-	522	1	0	27	2	30	4	186	-03.5	-05.0
18	JF	N75-54.0	W081-07.3	261	09	08	86	20.5	14-	582	1	0	28	2	30	5	191	-03.7	-05.1
18	JF	N75-59.1	W081-05.5	261	09	08	86	21.8	15-	637	1	0	32	1	31	5	187	-04.0	-05.0
18	JF	N76-03.9	W081-06.8	261	09	08	86	23.3	16-	682	1	0	34	1	34	2	183	-02.6	-04.0
18	JF	N76-09.1	W079-42.6	260	09	09	86	02.7	17-	137	1	4	00	0	34	1	170	-03.5	-04.2
18	JF	N76-12.8	W078-23.0	260	09	09	86	06.0	18-	157	1	4	00	0	33	6	166	-03.5	-04.7
18	JF	N76-15.6	W077-02.5	260	09	09	86	08.3	19-	297	1	0	01	4	36	6	158	-03.6	-04.5
18	JF	N76-20.4	W075-35.9	260	09	09	86	10.5	20-	332	1	0	01	5	02	6	148	-01.9	-04.5
18	JF	N76-21.8	W074-17.2	260	09	09	86	12.5	21-	469	1	0	01	3	01	5	133	-01.5	-02.0
18	JF	N76-24.5	W072-53.9	260	09	09	86	14.6	22-	602	1	0	01	3	01	4	119	-00.6	-01.0
18	JF	N76-27.8	W071-30.4	260	09	09	86	17.4	23-	517	1	0	36	2	01	4	104	+00.5	+01.1

STATION DATA MIZLANT 86 (ARCTIC EAST 1986)

NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N76-29.8	W070-28.5	260	09	09	86	20.1	24-	102	1	0	15	2	15	6	115	00.0	00.0
18	JF	N76-40.7	W071-26.0	260	09	10	86	21.0	25-	647	1	0	31	1	32	2	260	-01.0	-01.4
18	JF	N76-51.6	W072-37.0	260	09	10	86	23.5	26-	227	1	0	31	1	33	2	259	-02.1	-03.0
18	JF	N76-59.6	W074-03.1	260	09	11	86	01.3	27-	492	1	0	36	2	00	0	260	-01.8	-02.6
18	JF	N77-09.1	W075-21.2	260	09	11	86	03.5	28-	557	1	0	17	1	27	1	260	-02.4	-02.8
18	JF	N77-18.0	W076-44.8	260	09	11	86	06.6	29-	457	1	0	00	0	30	4	254	-02.0	-03.0
18	JF	N77-22.8	W077-24.0	260	09	11	86	08.1	30-	127	1	5	36	1	36	4	207	-02.4	-03.1
18	JF	N77-31.5	W076-21.5	260	09	11	86	11.1	31-	372	1	0	35	0	36	1	255	-03.0	-03.6
18	JF	N77-35.7	W074-59.9	260	09	11	86	12.9	32-	657	1	0	04	1	36	3	250	-01.9	-03.0
18	JF	N77-40.6	W073-34.5	260	09	11	86	15.0	33-	237	1	0	36	1	34	3	243	-01.4	-02.3
18	JF	N77-43.9	W072-45.8	260	09	11	86	16.2	34-	132	1	0	00	0	00	0	243	-00.5	-01.0
18	JF	N77-55.3	W072-42.0	260	09	11	86	20.9	35-	77	1	0	00	0	34	2	240	-01.1	-01.4
18	JF	N77-58.8	W073-26.1	260	09	11	86	22.0	36-	237	1	0	00	0	36	4	237	-01.9	-02.0
18	JF	N78-04.0	W074-07.9	260	09	11	86	23.4	37-	717	1	0	00	0	01	4	232	-02.4	-03.0
18	JF	N78-07.8	W074-48.5	260	09	12	86	01.5	38-	647	1	0	00	0	36	3	230	-03.2	-03.5
18	JF	N78-14.7	W075-12.8	260	09	12	86	03.7	39-	207	1	9	00	0	30	1	232	-04.0	-04.3
18	JF	N78-12.1	W074-43.8	260	09	12	86	05.0	40-	592	1	6	00	0	34	3	231	-05.0	-05.5
18	JF	N78-13.2	W074-01.2	260	09	12	86	13.6	41-	687	1	0	00	1	01	5	248	-01.7	-02.8
18	JF	N78-13.1	W073-20.5	260	09	12	86	15.9	42-	477	1	2	01	3	01	6	245	-02.5	-03.7
18	JF	N78-14.5	W072-52.5	260	09	12	86	17.2	43-	107	1	0	01	5	01	7	239	-02.6	-03.5
18	JF	N78-17.9	W073-35.0	260	09	12	86	18.4	44-	607	1	5	00	0	27	6	246	-02.5	-04.5
18	JF	N78-23.0	W074-22.0	260	09	12	86	20.5	45-	347	1	9	00	0	16	4	252	-02.6	-03.5
18	JF	N78-24.0	W074-37.2	260	09	12	86	22.2	46-	507	1	9	00	0	35	4	242	-03.5	-04.5

STATION DATA MIZLANT 86 (ARCTIC EAST 1986)

NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N78-26.2	W074-14.8	260	09	13	86	00.5	47-	507	1	8	00	0	02	5	232	-01.8	-02.7
18	JF	N78-24.2	W073-15.8	260	09	13	86	02.6	48-	467	1	3	00	0	01	4	220	-02.5	-02.9
18	JF	N78-28.8	W072-46.0	260	09	13	86	03.0	49-	247	1	4	00	0	00	0	213	-02.5	-02.8
18	JF	N78-32.8	W073-28.0	260	09	13	86	05.0	50-	502	1	8	00	0	01	4	204	-02.0	-03.4
18	JF	N78-36.2	W074-16.0	260	09	13	86	08.5	51-	235	1	8	04	0	04	3	202	-01.9	-03.3
18	JF	N78-39.1	W073-35.0	260	09	13	86	09.8	52-	297	1	7	02	0	01	3	202	-03.4	-04.0
18	JF	N78-45.5	W073-54.5	260	09	13	86	11.3	53-	417	1	8	35	0	35	3	196	-03.4	-04.0
18	JF	N78-51.9	W074-30.1	260	09	13	86	13.2	54-	227	1	8	30	0	29	2	199	-03.2	-03.9
18	JF	N78-57.9	W075-00.0	260	09	13	86	14.3	55-	352	1	9	00	0	30	1	196	-03.2	-03.9
18	JF	N78-54.8	W074-09.0	260	09	13	86	16.3	56-	382	1	8	00	0	25	1	195	-03.1	-03.6
18	JF	N78-50.1	W073-03.0	260	09	13	86	18.5	57-	442	1	9	00	0	16	1	197	-03.6	-04.0
18	JF	N78-45.7	W072-08.0	260	09	13	86	21.2	58-	437	1	4	00	0	16	2	200	-02.0	-02.2
18	JF	N78-41.6	W071-38.0	260	09	13	86	22.3	59-	117	1	3	00	0	00	0	201	-01.6	-01.9
18	JF	N78-48.0	W071-52.0	260	09	13	86	23.6	60-	412	1	8	00	0	22	5	203	-00.5	-00.9
18	JF	N78-53.2	W072-27.0	260	09	14	86	01.0	61-	242	1	0	00	0	21	6	208	-00.1	-00.7
18	JF	N79-02.4	W072-14.8	260	09	14	86	02.2	62-	197	1	7	00	0	21	5	210	-00.4	-00.7
18	JF	N78-49.2	W070-36.1	260	09	14	86	05.0	63-	367	1	6	00	0	00	0	220	-01.0	-01.5
18	JF	N78-41.0	W071-11.0	260	09	14	86	08.5	64-	77	1	9	13	0	13	1	221	-02.5	-03.0
18	JF	N78-52.2	W071-15.5	260	09	14	86	10.0	65-	357	1	8	13	0	12	4	220	-00.1	-00.5
18	JF	N78-54.9	W070-37.0	260	09	14	86	11.5	66-	392	1	9	00	0	10	1	219	-03.1	-03.4
18	JF	N78-54.8	W069-37.5	259	09	14	86	13.0	67-	87	1	7	11	0	12	1	211	-02.0	-02.9
18	JF	N78-59.8	W070-21.0	260	09	14	86	14.3	68-	247	1	7	00	0	08	1	215	-01.9	-02.5
18	JF	N79-02.9	W071-07.3	260	09	14	86	15.6	69-	162	1	7	00	0	21	4	211	-00.7	-01.1

STATION DATA MIZLANT 86 (ARCTIC EAST 1986)

NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N79-07.4	W071-47.5	260	09	14	86	16.6	70-	177	1	1	00	0	20	4	207	-01.5	-01.7
18	JF	N79-13.1	W072-53.0	260	09	14	86	18.5	71-	262	1	7	00	0	00	0	198	-02.5	-02.7
18	JF	N79-18.8	W073-57.8	260	09	14	86	21.0	72-	177	1	9	00	0	02	1	189	-02.2	-02.3
18	JF	N79-28.2	W073-14.5	260	09	14	86	23.5	73-	187	1	8	00	0	23	1	186	-01.5	-01.5
18	JF	N79-36.5	W072-35.1	260	09	15	86	01.3	74-	117	1	8	00	0	00	0	180	-01.5	-01.5
18	JF	N79-32.5	W071-54.1	260	09	15	86	04.0	75-	252	1	3	00	0	34	2	201	-01.2	-01.5
18	JF	N79-20.0	W070-05.3	260	09	15	86	07.0	76-	237	1	9	00	0	20	3	177	-01.6	-01.8
18	JF	N79-11.3	W068-39.5	259	09	15	86	10.0	77-	297	1	9	00	0	09	3	175	-01.0	-01.5
18	JF	N79-13.0	W068-43.0	259	09	15	86	13.7	78-	387	1	9	00	0	28	1	171	-01.2	-01.6
18	JF	N79-20.3	W068-30.6	259	09	15	86	15.5	79-	262	1	9	00	0	00	0	170	-05.2	-05.2
18	JF	N79-27.3	W069-43.2	259	09	15	86	20.0	80-	227	1	8	00	0	01	2	170	-04.0	-04.0
18	JF	N79-49.2	W070-07.3	260	09	16	86	01.5	81-	232	1	3	00	0	05	2	171	-04.2	-04.5
18	JF	N80-02.2	W070-11.9	908	09	16	86	04.1	82-	202	1	9	00	0	01	4	179	-04.6	-05.7
18	JF	N79-58.0	W069-19.8	259	09	16	86	05.6	83-	252	1	4	00	0	01	5	174	-03.4	-03.6
18	JF	N79-55.9	W067-54.1	259	09	16	86	07.0	84-	117	1	6	00	0	01	4	174	-02.6	-03.1
18	JF	N80-04.1	W067-48.2	907	09	16	86	09.3	85-	227	1	1	36	1	36	4	175	-02.0	-04.0
18	JF	N80-21.7	W067-36.0	907	09	16	86	11.5	86-	162	1	6	00	0	02	4	174	-03.6	-04.4
18	JF	N80-23.1	W068-09.8	907	09	16	86	13.6	87-	247	1	8	00	0	01	3	175	-05.0	-05.6
18	JF	N80-25.6	W068-56.0	907	09	16	86	19.5	88-	337	1	8	00	0	33	1	158	-04.5	-04.8
18	JF	N80-36.8	W067-48.5	907	09	16	86	23.6	89-	357	1	5	00	0	27	2	140	-04.4	-04.6
18	JF	N80-44.7	W067-10.0	907	09	17	86	02.7	90-	347	1	7	00	0	00	0	129	-04.0	-05.0
18	JF	N80-54.4	W066-30.0	907	09	17	86	06.8	91-	422	1	9	00	0	20	1	112	-05.1	-05.5
18	JF	N81-06.1	W065-12.7	907	09	17	86	10.0	92-	422	1	5	00	0	00	0	090	-06.0	-06.0

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NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N81-17.8	W064-24.5	907	09	17	86	13.3	93-	447	1	9	00	0	06	2	068	-06.8	-07.0
18	JF	N81-24.3	W064-18.5	907	09	17	86	16.3	94-	622	1	9	00	0	35	1	048	-06.5	-06.7
18	JF	N81-33.7	W063-35.2	907	09	17	86	20.3	95-	767	1	9	00	0	20	2	035	-07.5	-08.0
18	JF	N81-54.5	W062-33.2	907	09	18	86	02.0	96-	662	1	9	00	0	21	3	045	-06.5	-07.0
18	JF	N82-06.7	W061-27.8	907	09	18	86	05.3	97-	607	1	9	19	1	21	4	029	-06.2	-06.6
18	JF	N82-08.3	W061-26.0	907	09	18	86	09.5	98-	562	1	9	00	0	21	6	033	-06.0	-06.4
18	JF	N82-07.0	W061-26.5	907	09	18	86	12.0	99-	607	1	8	23	0	21	6	034	-05.5	-05.8
18	JF	N82-06.7	W061-25.8	907	09	18	86	14.1	100-	607	1	8	22	1	21	5	039	-05.2	-05.6
18	JF	N82-06.8	W061-26.2	907	09	18	86	14.7	101-	552	1	8	22	1	21	6	039	-05.1	-05.6
18	JF	N82-08.8	W061-20.0	907	09	18	86	15.5	102-	537	1	8	21	1	21	6	040	-05.0	-05.6
18	JF	N82-02.0	W061-23.1	907	09	18	86	18.3	103-	562	1	9	00	0	21	6	042	-04.9	-05.4
18	JF	N82-00.3	W062-00.9	907	09	18	86	19.5	104-	592	1	9	00	0	21	7	037	-04.5	-05.0
18	JF	N81-55.1	W061-28.6	907	09	18	86	21.5	105-	737	1	9	00	0	22	7	040	-05.5	-06.0
18	JF	N81-56.9	W061-42.4	907	09	19	86	01.6	106-	562	1	9	00	0	23	7	045	-04.0	-05.2
18	JF	N80-21.4	W067-37.0	907	09	20	86	01.3	107-	182	1	9	00	0	05	3	129	-02.7	-03.0
18	JF	N80-23.7	W068-25.7	907	09	20	86	06.7	108-	377	1	9	00	0	03	7	155	-06.3	-07.0
18	JF	N80-25.3	W069-03.3	907	09	20	86	08.3	109-	347	1	6	03	0	03	6	166	-05.9	-06.9
18	JF	N78-12.3	W075-07.4	260	09	21	86	19.7	110-	207	1	5	00	0	03	7	120	-06.0	-06.6
18	JF	N78-12.6	W074-52.7	260	09	21	86	21.0	111-	587	1	5	00	0	03	7	120	-05.5	-06.0
18	JF	N78-11.9	W074-12.4	260	09	22	86	03.3	112-	627	1	0	04	3	03	7	119	-06.0	-06.7
18	JF	N78-12.4	W073-43.4	260	09	22	86	00.0	113-	677	1	0	05	3	05	8	110	-07.8	-08.0
18	JF	N78-12.4	W072-59.9	260	09	22	86	01.3	114-	212	1	0	04	3	04	7	111	-07.3	-08.1
18	JF	N78-23.5	W074-06.4	260	09	22	86	07.0	115-	437	1	9	00	0	01	7	130	-07.5	-08.5

STATION DATA MIZLANT 86 (ARCTIC EAST 1986)

NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N78-23.0	W074-13.1	260	09	22	86	09.0	115-A	467	1	9	00	0	02	5	131	-07.4	-08.1
18	JF	N78-22.8	W074-15.5	260	09	22	86	10.0	115-B	457	1	9	00	0	02	6	135	-07.5	-08.1
18	JF	N78-22.8	W074-15.0	260	09	22	86	11.0	115-C	467	1	9	00	0	01	6	130	-07.4	-08.1
18	JF	N78-22.6	W074-17.6	260	09	22	86	12.0	115-D	477	1	9	00	0	01	6	132	-07.6	-08.1
18	JF	N78-22.4	W074-17.4	260	09	22	86	13.0	115-E	495	1	9	00	0	01	5	132	-07.6	-08.2
18	JF	N78-22.2	W074-19.1	260	09	22	86	14.0	115-F	432	1	9	00	0	02	5	132	-07.9	-08.6
18	JF	N78-21.4	W074-21.5	260	09	22	86	15.0	115-G	417	1	9	00	0	02	5	131	-08.1	-08.8
18	JF	N78-21.3	W074-24.4	260	09	22	86	16.0	115-H	482	1	9	00	0	01	5	136	-08.0	-08.7
18	JF	N78-20.4	W074-27.6	260	09	22	86	17.0	115-I	502	1	9	00	0	02	5	140	-07.9	-08.6
18	JF	N78-19.5	W074-30.6	260	09	22	86	18.0	115-J	512	1	9	00	0	02	6	143	-08.0	-08.5
18	JF	N78-18.7	W074-33.8	260	09	22	86	19.0	115-K	577	1	9	00	0	03	6	144	-08.0	-08.5
18	JF	N78-17.3	W074-36.5	260	09	22	86	20.2	115-L	467	1	9	00	0	01	5	143	-08.0	-08.5
18	JF	N78-16.4	W074-36.5	260	09	22	86	22.5	115-M	567	1	9	03	0	03	6	145	-08.7	-08.9
18	JF	N78-12.1	W074-50.0	260	09	23	86	04.0	115-N	602	1	9	00	0	02	6	143	-09.5	-10.0
18	JF	N78-10.7	W074-53.2	260	09	23	86	05.0	115-O	607	1	9	00	0	02	6	144	-09.6	-10.5
18	JF	N78-09.3	W074-58.2	260	09	23	86	06.0	115-P	617	1	9	00	0	03	6	145	-08.8	-09.1
18	JF	N78-08.0	W075-01.4	260	09	23	86	07.0	115-Q	607	1	9	00	0	03	6	148	-09.0	-09.2
18	JF	N78-06.2	W075-05.2	260	09	23	86	08.0	115-R	607	1	9	00	0	03	5	150	-09.0	-09.5
18	JF	N78-04.6	W075-08.7	260	09	23	86	09.1	115-S	592	1	9	00	0	03	5	151	-08.6	-09.3
18	JF	N78-03.2	W075-11.4	260	09	23	86	10.0	115-T	577	1	9	00	0	03	6	151	-08.5	-09.3
18	JF	N78-01.9	W075-10.5	260	09	23	86	11.0	115-U	627	1	9	00	0	03	6	150	-08.4	-09.0
18	JF	N78-00.2	W075-12.2	260	09	23	86	12.0	115-V	622	1	9	00	0	04	6	150	-07.5	-08.0
18	JF	N77-59.4	W075-13.9	260	09	23	86	13.0	115-W	637	1	9	00	0	02	5	147	-07.4	-07.9

STATION DATA MIZLANT 86 (ARCTIC EAST 1986)

NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N77-57.6	W075-15.2	260	09	23	86	14.0	115-X	652	1	9	00	0	02	5	142	-07.6	-08.5
18	JF	N77-56.3	W075-17.2	260	09	23	86	15.0	115-Y	637	1	9	00	0	02	5	146	-07.9	-08.4
18	JF	N77-54.9	W075-20.7	260	09	23	86	16.0	115-Z	612	1	9	00	0	03	6	149	-07.7	-08.1
18	JF	N77-53.3	W075-23.7	260	09	23	86	17.0	116-	592	1	9	00	0	03	7	149	-07.8	-08.2
18	JF	N77-51.5	W075-34.2	260	09	23	86	18.5	117-	597	1	9	00	0	04	6	149	-08.0	-08.5
18	JF	N77-52.9	W074-19.6	260	09	23	86	21.0	118-	707	1	0	36	3	01	7	149	-07.1	-07.4
18	JF	N77-23.0	W074-31.1	260	09	24	86	07.7	119-	717	1	0	36	4	02	6	145	-04.5	-05.0
18	JF	N76-40.8	W074-27.0	260	09	24	86	16.3	120-	557	1	0	02	4	02	5	145	-01.0	-01.5
18	JF	N76-23.3	W072-43.6	260	09	24	86	20.5	121-	547	1	0	14	2	10	4	150	-01.0	-01.2
18	JF	N75-55.6	W061-29.0	259	09	25	86	14.0	122-	527	1	0	30	0	29	3	087	+01.5	+00.0
18	JF	N75-44.6	W061-52.7	259	09	25	86	15.8	123-	437	1	0	31	2	28	4	082	+00.6	-00.7
18	JF	N75-33.0	W062-11.5	259	09	25	86	17.3	124-	1042	1	0	30	2	29	5	083	+00.3	-00.8
18	JF	N75-20.7	W062-34.4	259	09	25	86	19.2	125-	237	1	0	34	3	29	5	085	+00.0	-00.3
18	JF	N75-09.8	W062-54.1	259	09	25	86	20.7	126-	177	1	0	35	2	30	6	089	+00.0	-01.0
18	JF	N75-00.2	W063-10.0	259	09	25	86	21.8	127-	127	1	0	31	2	30	6	098	-00.7	-01.3
18	JF	N74-49.6	W063-30.1	259	09	25	86	23.3	128-	262	1	0	29	2	30	6	110	-01.4	-01.8
18	JF	N74-38.1	W063-48.4	259	09	26	86	01.0	129-	372	1	2	00	0	29	6	118	-01.7	-01.9
18	JF	N74-25.5	W064-07.4	259	09	26	86	03.5	130-	912	1	3	00	0	29	5	129	-02.2	-02.8
18	JF	N74-16.0	W064-24.0	259	09	26	86	05.0	131-	957	1	2	00	0	30	5	133	-01.1	-01.9
18	JF	N74-07.1	W064-55.7	259	09	26	86	07.0	132-	>1600	1	0	28	2	31	4	136	-01.5	-02.1
18	JF	N74-39.9	W065-34.7	259	09	26	86	10.5	133-	>1600	1	6	00	0	29	3	120	-02.0	-03.4
18	JF	N74-53.2	W065-27.0	259	09	26	86	12.5	134-	417	1	6	00	0	28	4	110	-01.2	-02.4
18	JF	N75-05.4	W065-17.7	259	09	26	86	14.3	135-	322	1	3	29	0	29	4	099	-02.1	-03.2

STATION DATA MIZLANT 86 (ARCTIC EAST 1986)

NAT	SHIP	LAT	LONG	MSQ	MO	DY	YR	HR	STA	DPTH	NAV	ICE	WVD	HT	WND	V	BAR	DRY	WET
18	JF	N75-17.3	W065-10.0	259	09	26	86	15.7	136-	222	1	0	29	0	29	4	087	-02.2	-03.2
18	JF	N75-29.9	W065-04.2	259	09	26	86	17.0	137-	162	1	0	30	0	31	3	080	-02.5	-03.5
18	JF	N75-42.1	W064-52.0	259	09	26	86	18.5	138-	617	1	0	35	1	35	3	072	-02.0	-02.1
18	JF	N75-52.0	W064-47.0	259	09	26	86	20.3	139-	622	1	3	00	0	01	5	058	-02.0	-02.5
18	JF	N75-47.5	W065-28.6	259	09	26	86	22.0	140-	542	1	4	00	0	34	5	045	-02.4	-02.7
18	JF	N75-42.2	W066-08.7	259	09	26	86	23.3	141-	562	1	0	00	0	34	2	033	-02.5	-02.7
18	JF	N75-38.3	W067-00.0	259	09	27	86	01.0	142-	437	1	0	00	0	32	3	022	-01.5	-02.3
18	JF	N75-33.0	W067-35.5	259	09	27	86	02.3	143-	337	1	0	00	0	32	3	013	-02.6	-03.1
18	JF	N75-27.3	W068-17.5	259	09	27	86	03.7	144-	397	1	0	33	2	33	5	010	-02.1	-02.8
18	JF	N75-22.3	W068-56.0	259	09	27	86	05.0	145-	592	1	0	36	5	33	7	004	-03.0	-04.7

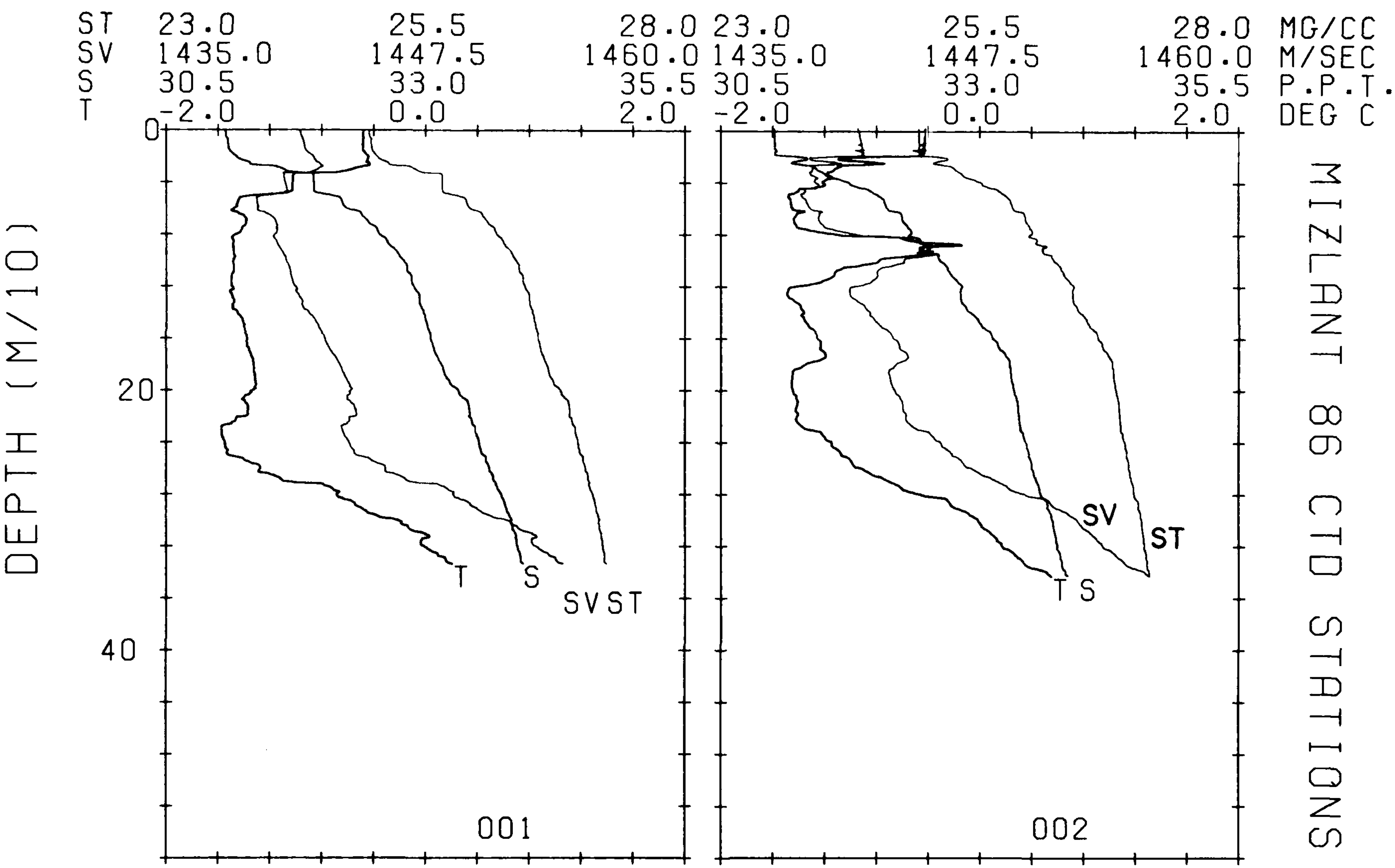
APPENDIX B

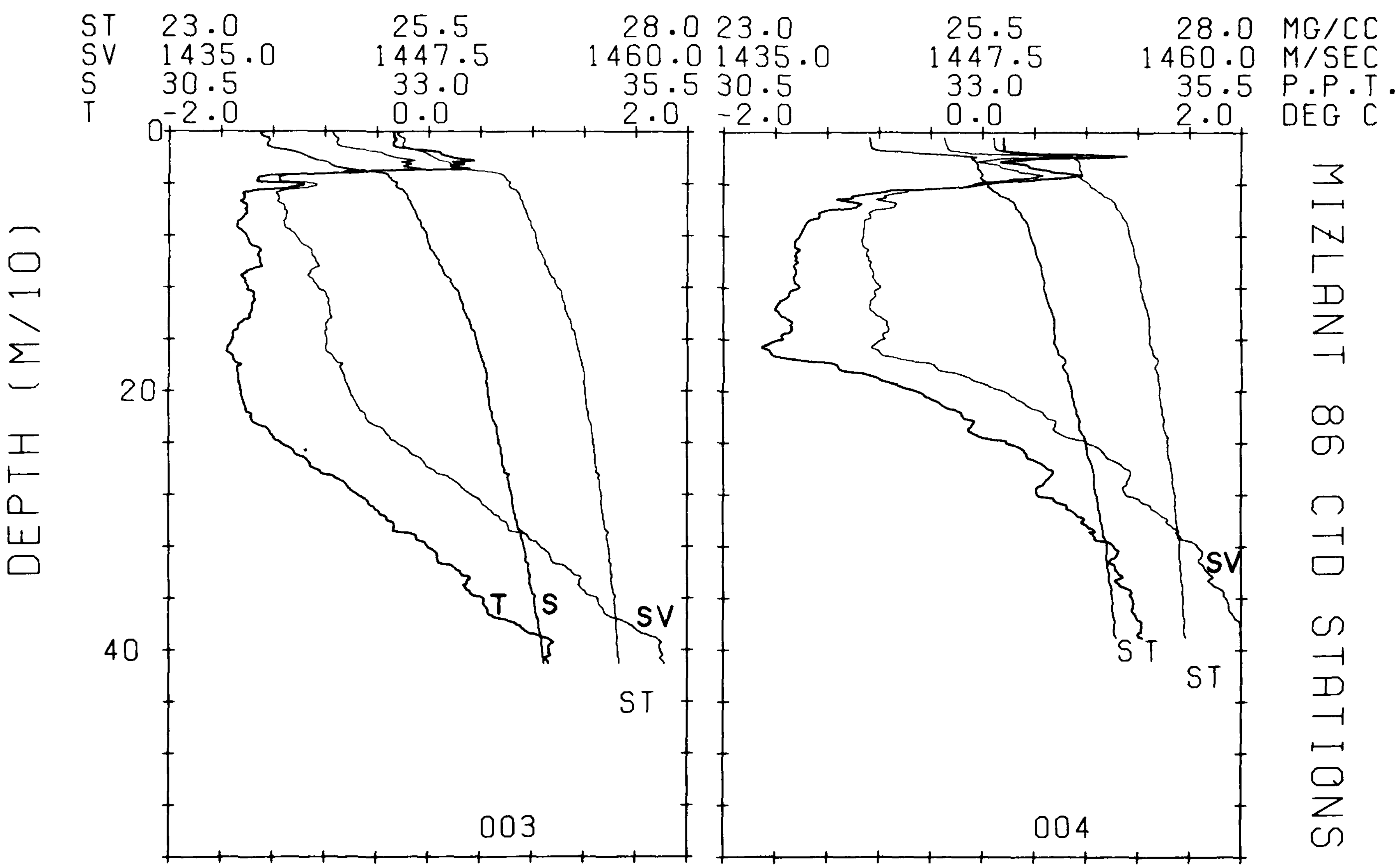
Property Profiles For MIZLANT 86 Stations

This section contains plots of temperature, salinity, sound speed, and density (sigma-t) for all but one of the 145 stations occupied during MIZLANT 86 which were successfully recovered from the data logging system. Station 64 is missing due to difficulties in recovering the data. Both down and up profiles were obtained at each station but only down profiles are presented in this report, except for Stations 2, 95, 97, 101, 116, and 120A for which it was felt the up-trace was more accurate.

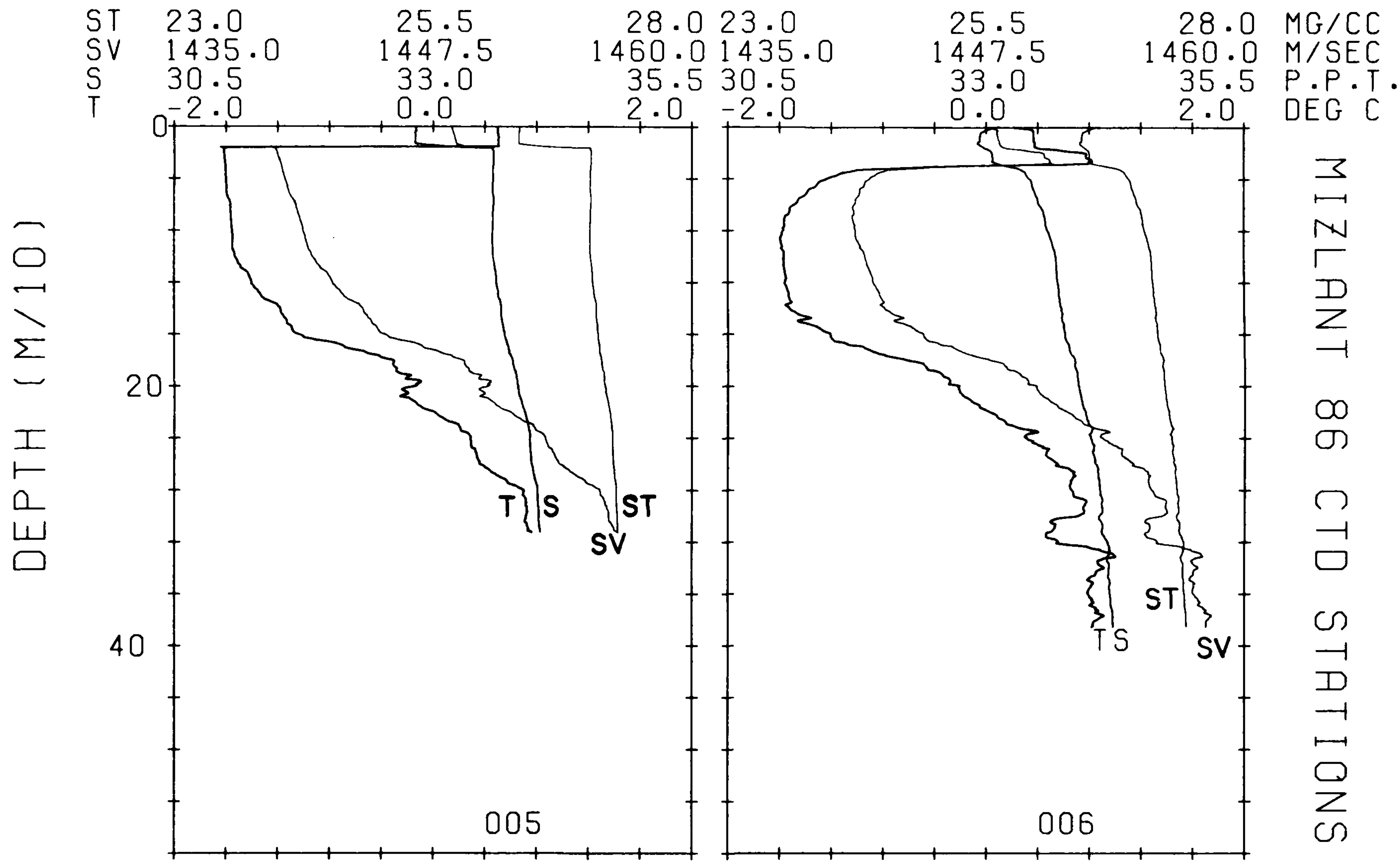
A time-series of hourly CTD lowerings was conducted at Station 115. Although data were collected, edited, and stored for each lowering, only the beginning and end plots, Stations 115 and 116, respectively, are included.

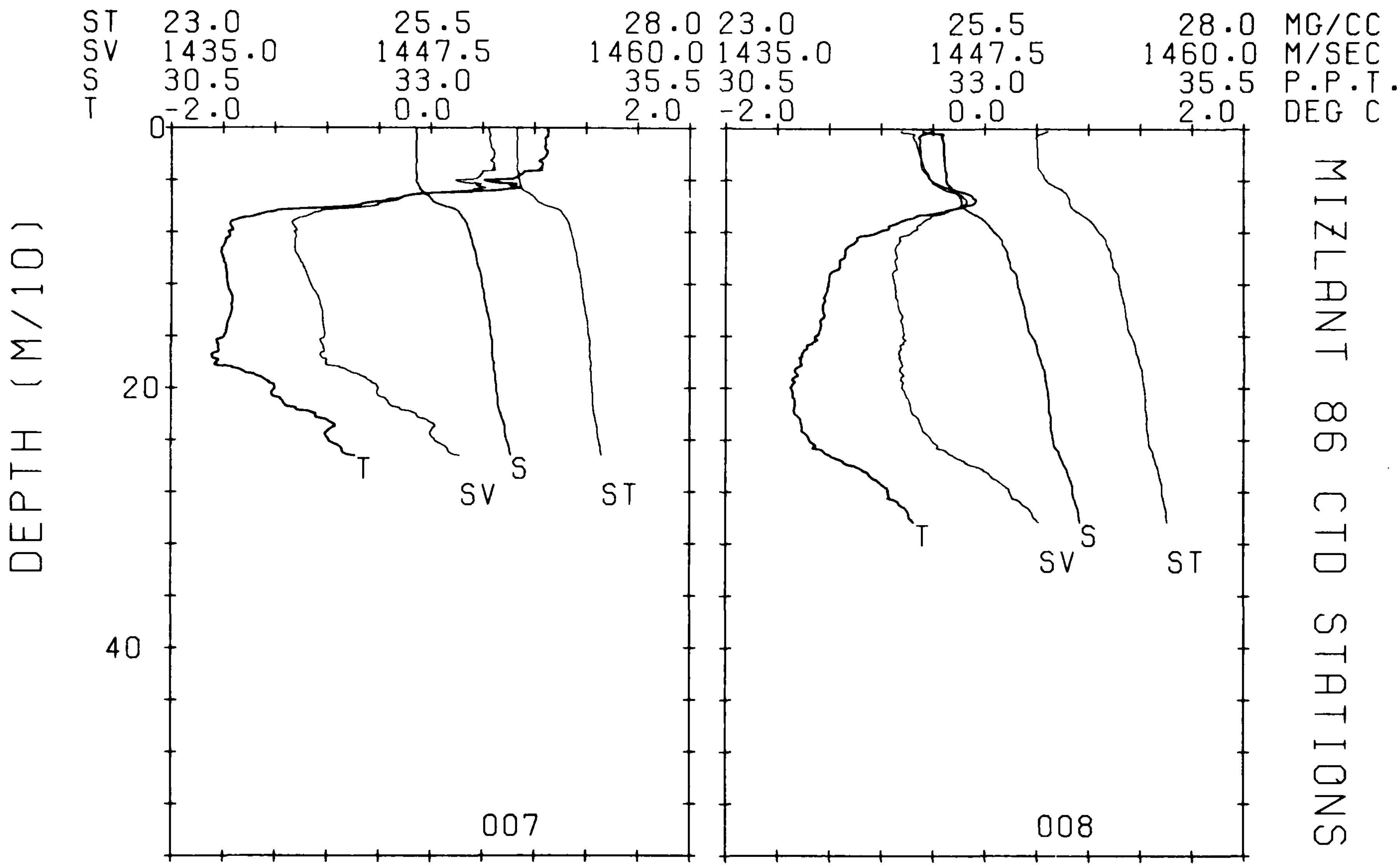
Two stations are plotted per page, each extending to a depth of 560 m. Several stations extended to depths exceeding 600 m with the deepest extending to 750 m (Stations 37, 41, 95, 119, 130, and 131) but little information is lost as temperatures and salinities below 560 m are essentially constant. Occasionally, the property scales had to be slightly changed to avoid profiles overlying one another. To assist in distinguishing between curves the temperature profile has been darkened four times and the salinity trace three times. The curves are also labeled: T for temperature, S for salinity, SV for sound velocity, and ST for sigma-t.


MIZLANT 86 CTD STATIONS
ST SV S T
23.0 1435.0 30.5 -2.0
25.5 1447.5 33.0 0.0
28.0 1460.0 35.5 2.0
MG/CC M/SEC P.P.T. DEG C
DEPTH (M/10)
0
20
40
T S SVST
SV ST
T S
001
002

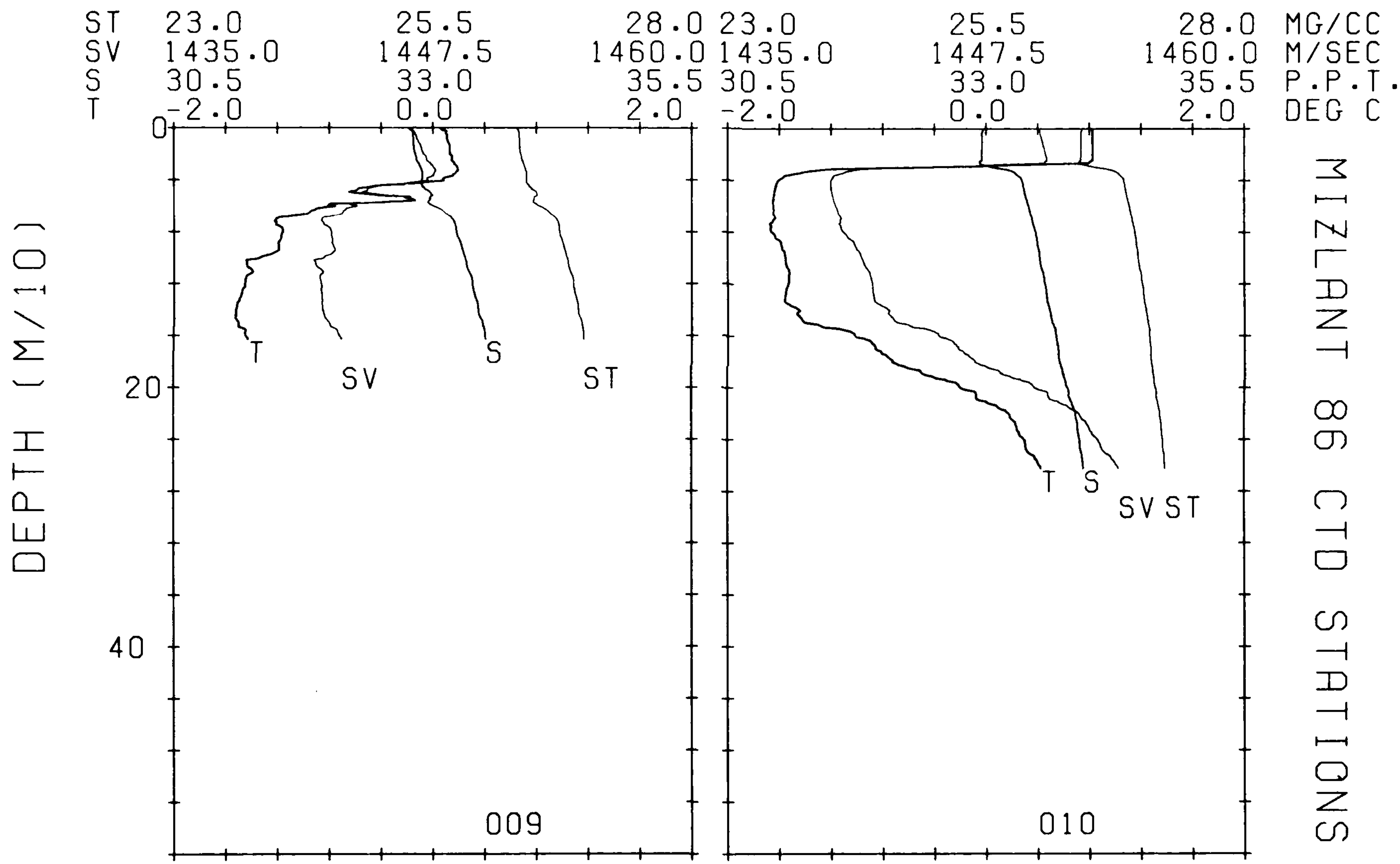


MIZLANT 86 CTD STATIONS
ST 23.0 25.5 28.0
SV 1435.0 1447.5 1460.0
S 30.5 33.0 35.5
T -2.0 0.0 2.0
MG/CC
M/SEC
P.P.T.
DEG C
DEPTH (M/10)
0
20
40
T
S
SV
ST
003
004

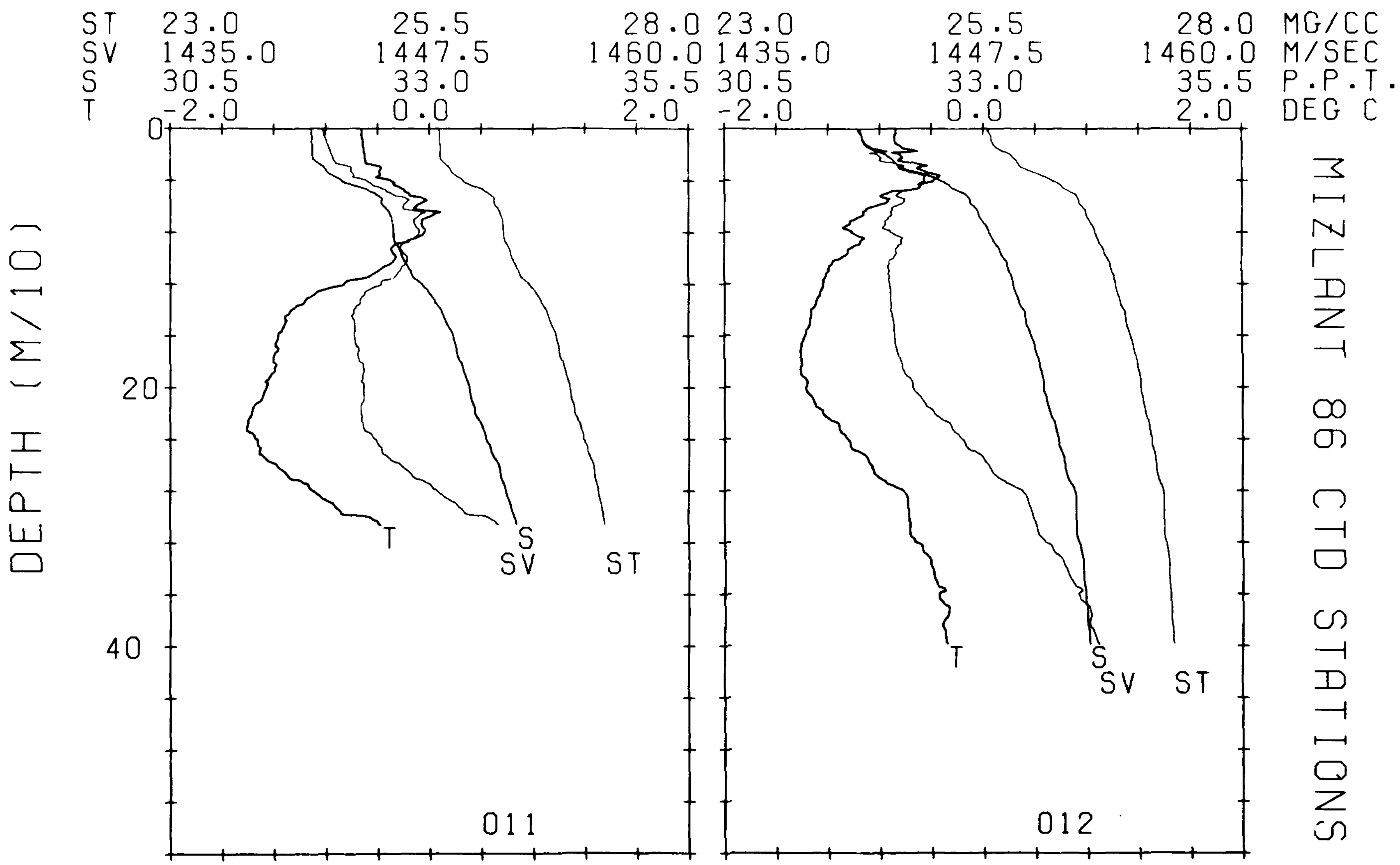

MIZLANT 86 CTD STATIONS
ST 23.0 25.5 28.0 MG/CC
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
S
ST
SV
005
006



ST 23.0 25.5 28.0 23.0 25.5 28.0 MG/CC
SV 1435.0 1447.5 1460.0 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 -2.0 0.0 2.0 DEG C
MIZLANT 86 CTD STATIONS
DEPTH (M/10)
0
20
40
T
SV
S
ST
007
008



MIZLANT 86 CTD STATIONS
ST 23.0 25.5 28.0 23.0 25.5 28.0 MG/CC
SV 1435.0 1447.5 1460.0 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
SV
S
ST
009
T
S
SV ST
010



MIZLANT 86 CTD STATIONS
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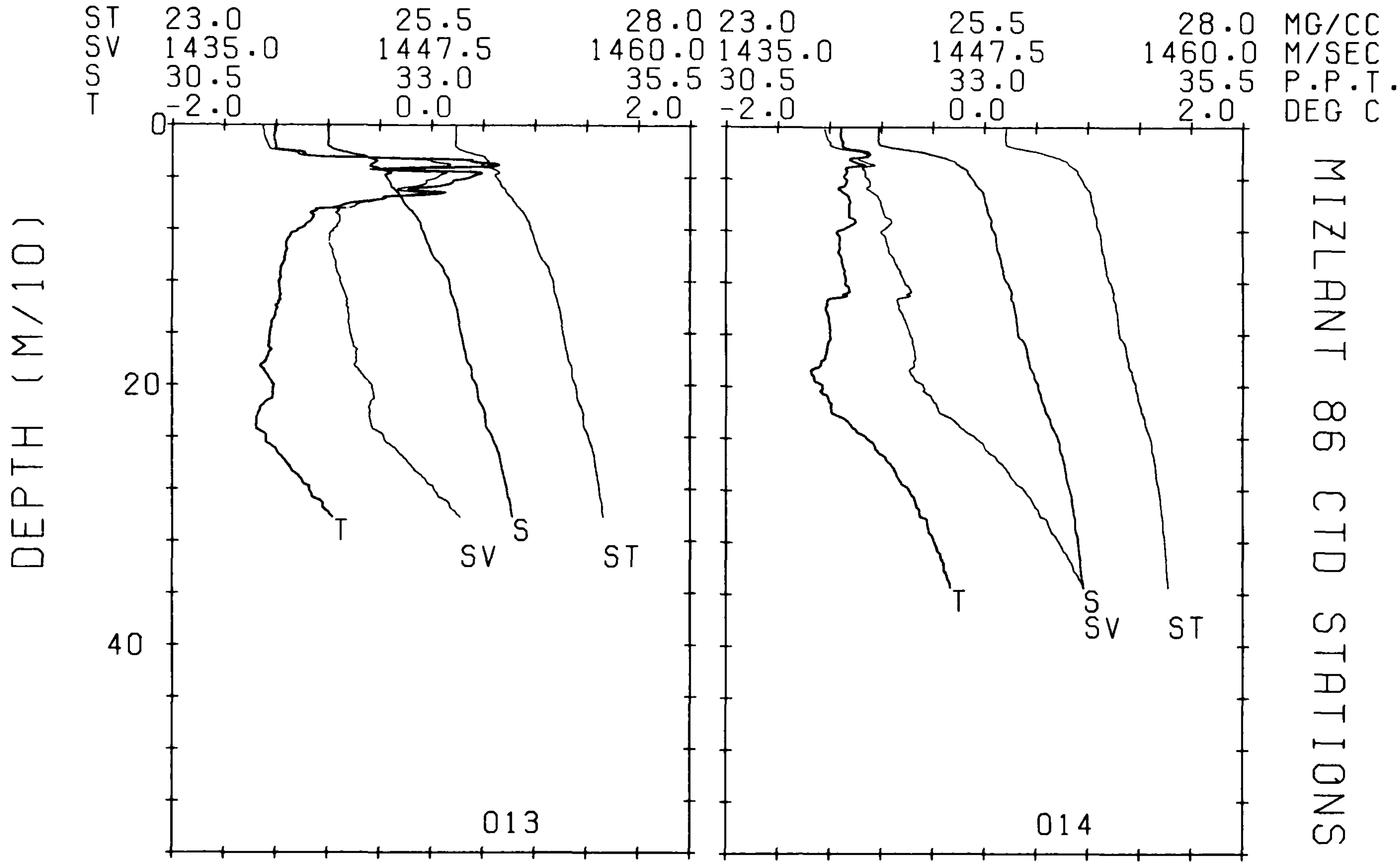
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
S
SV
ST
011
012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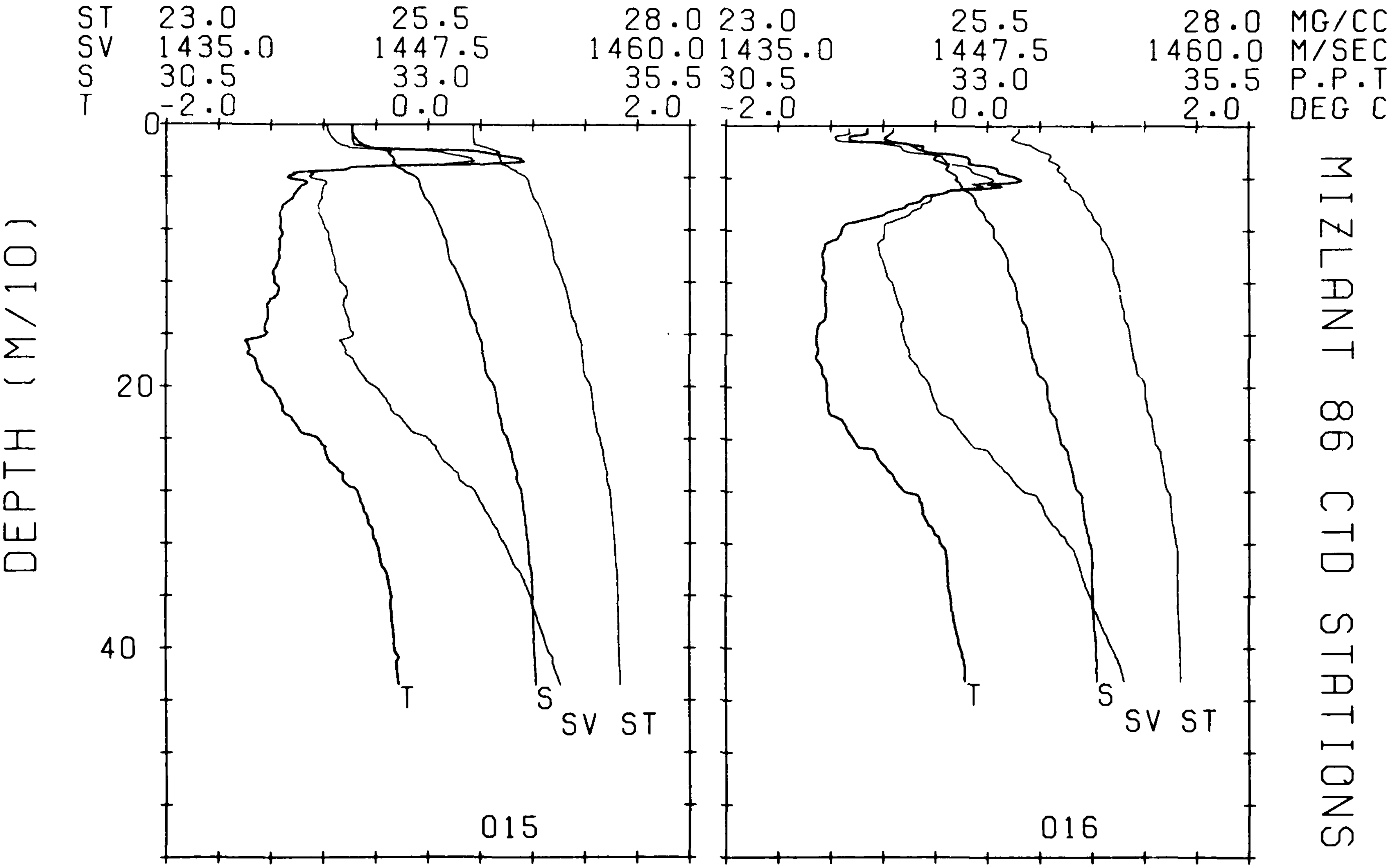
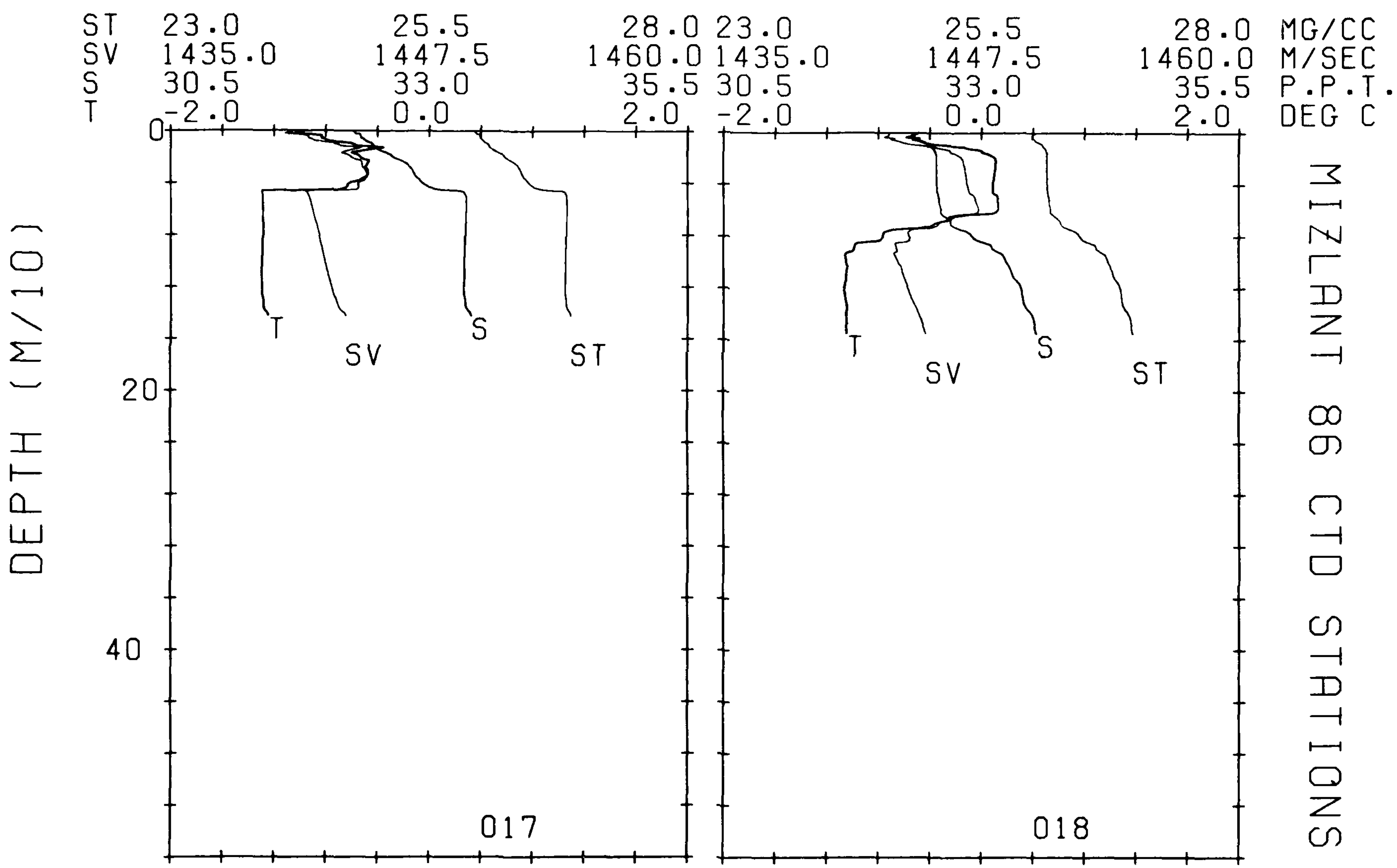
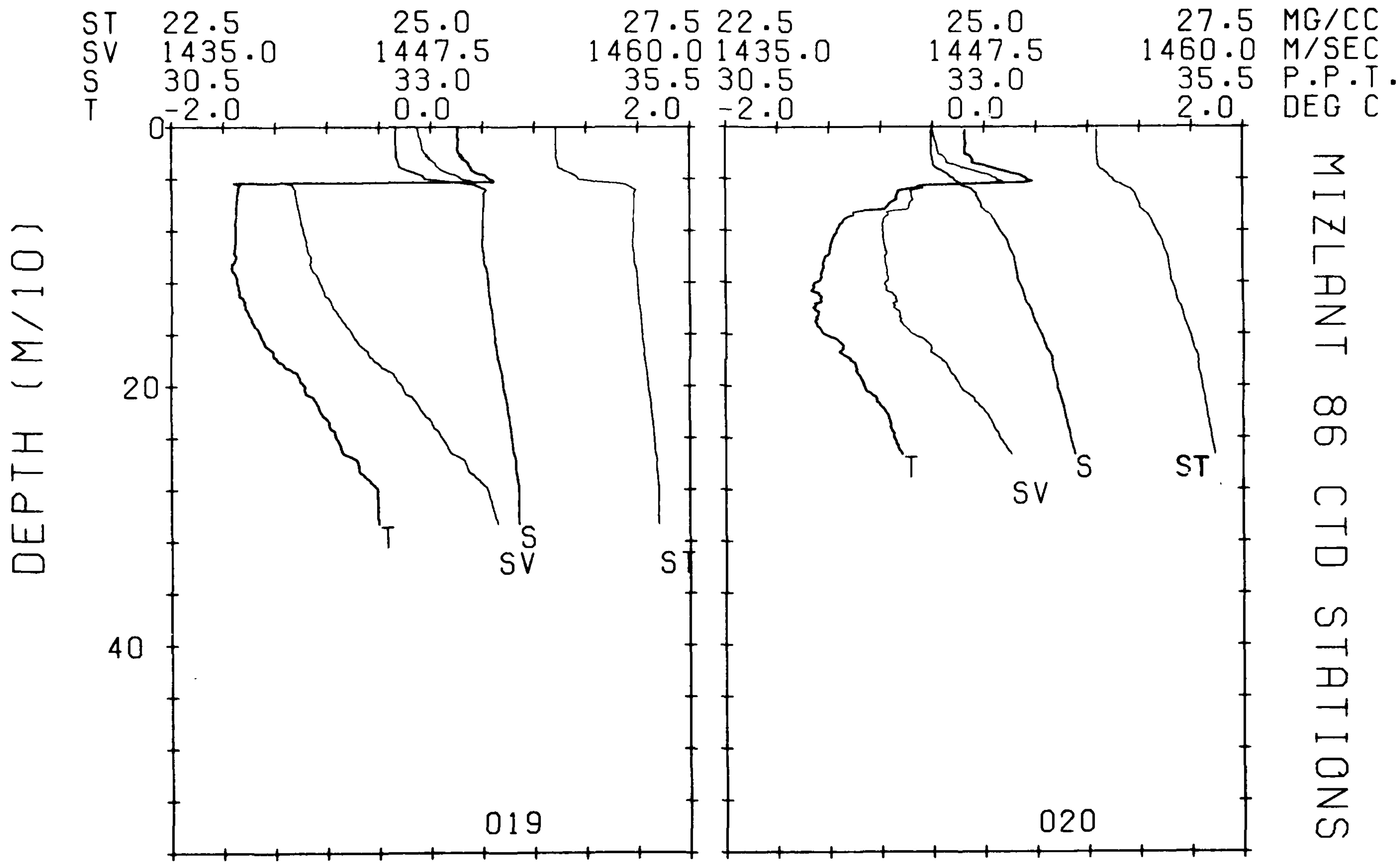
ST 23.0 25.5 28.0 MG/CC
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
SV
S
ST
013
014



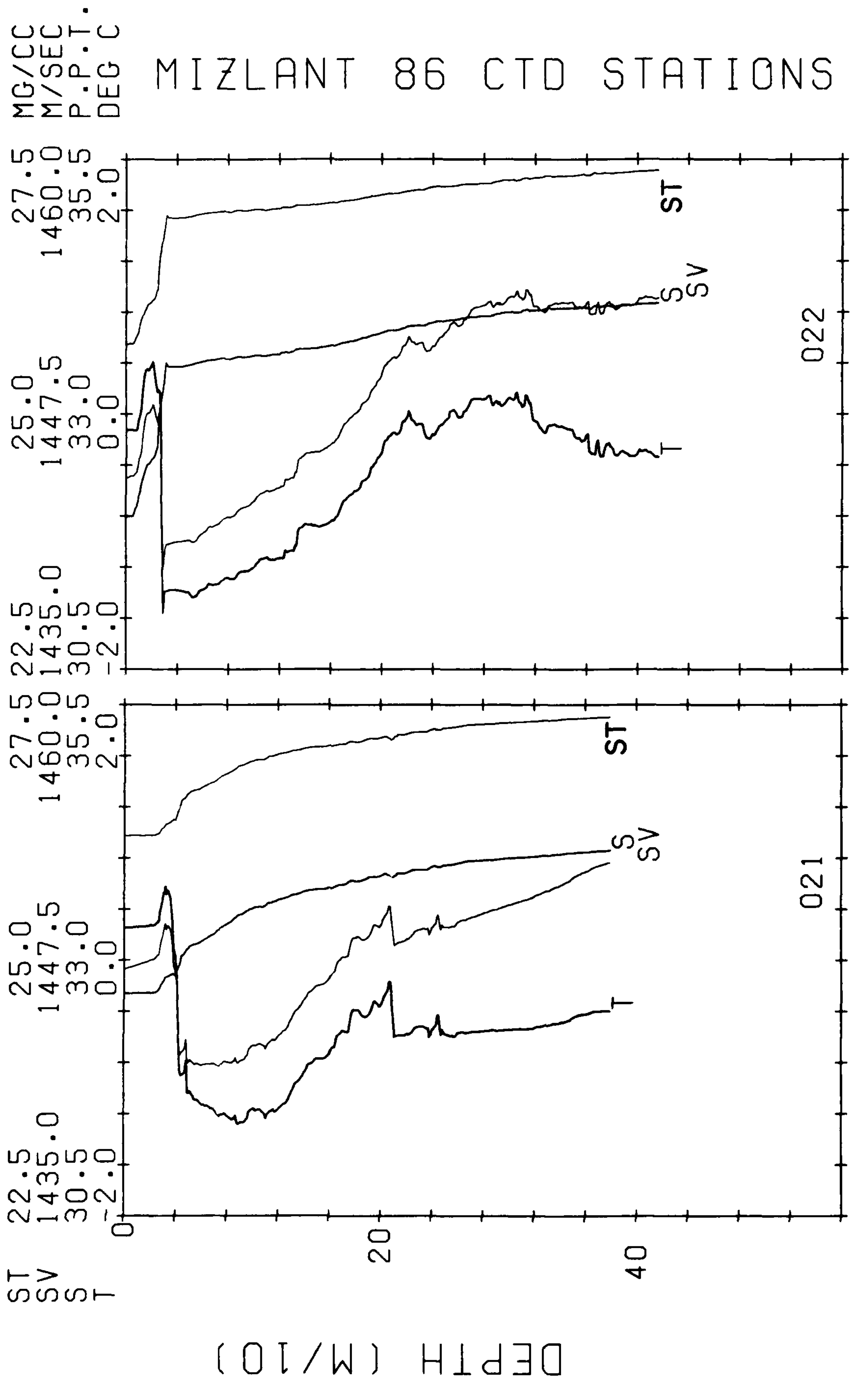
MIZLANT 86 CTD STATIONS
ST 23.0 25.5 28.0
SV 1435.0 1447.5 1460.0
S 30.5 33.0 35.5
T -2.0 0.0 2.0
23.0 25.5 28.0 MG/CC
1435.0 1447.5 1460.0 M/SEC
30.5 33.0 35.5 P.P.T.
-2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
S
SV ST
015
016



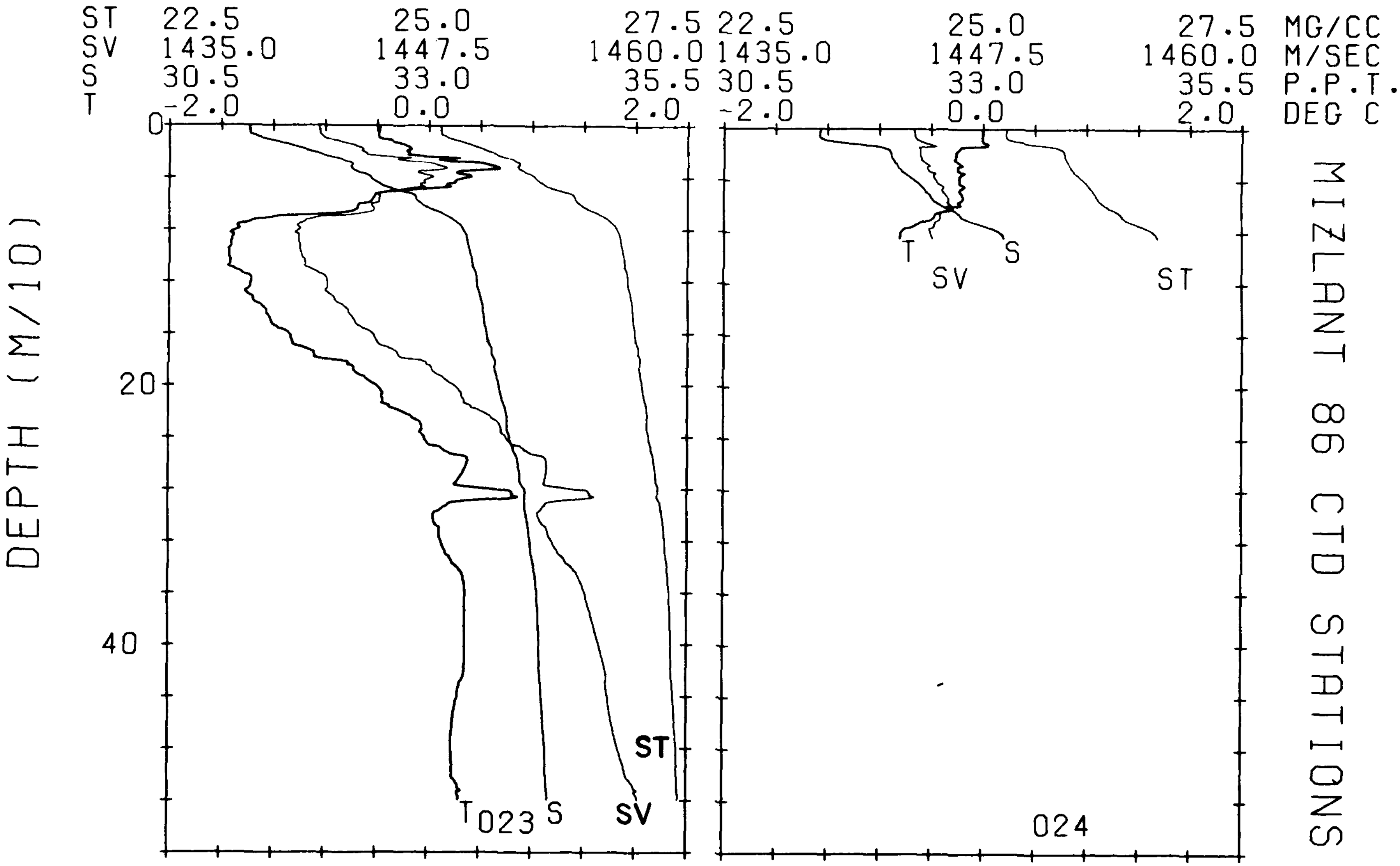
MIZLANT 86 CTD STATIONS
ST 23.0 25.5 28.0 23.0 25.5 28.0 MG/CC
SV 1435.0 1447.5 1460.0 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
SV
S
ST
017
018



MIZLANT 86 CTD STATIONS
ST 22.5 25.0 27.5 MG/CC
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
SV
S
ST
019
020



MIZLANT 86 CTD STATIONS
MG/CC
M/SEC
P.P.T.
DEG C
27.5
1460.0
35.5
2.0
25.0
1447.5
33.0
0.0
22.5
1435.0
30.5
-2.0
ST
SV
S
T
022
021
0
20
40
DEPTH (M/10)


MIZLANT 86 CTD STATIONS
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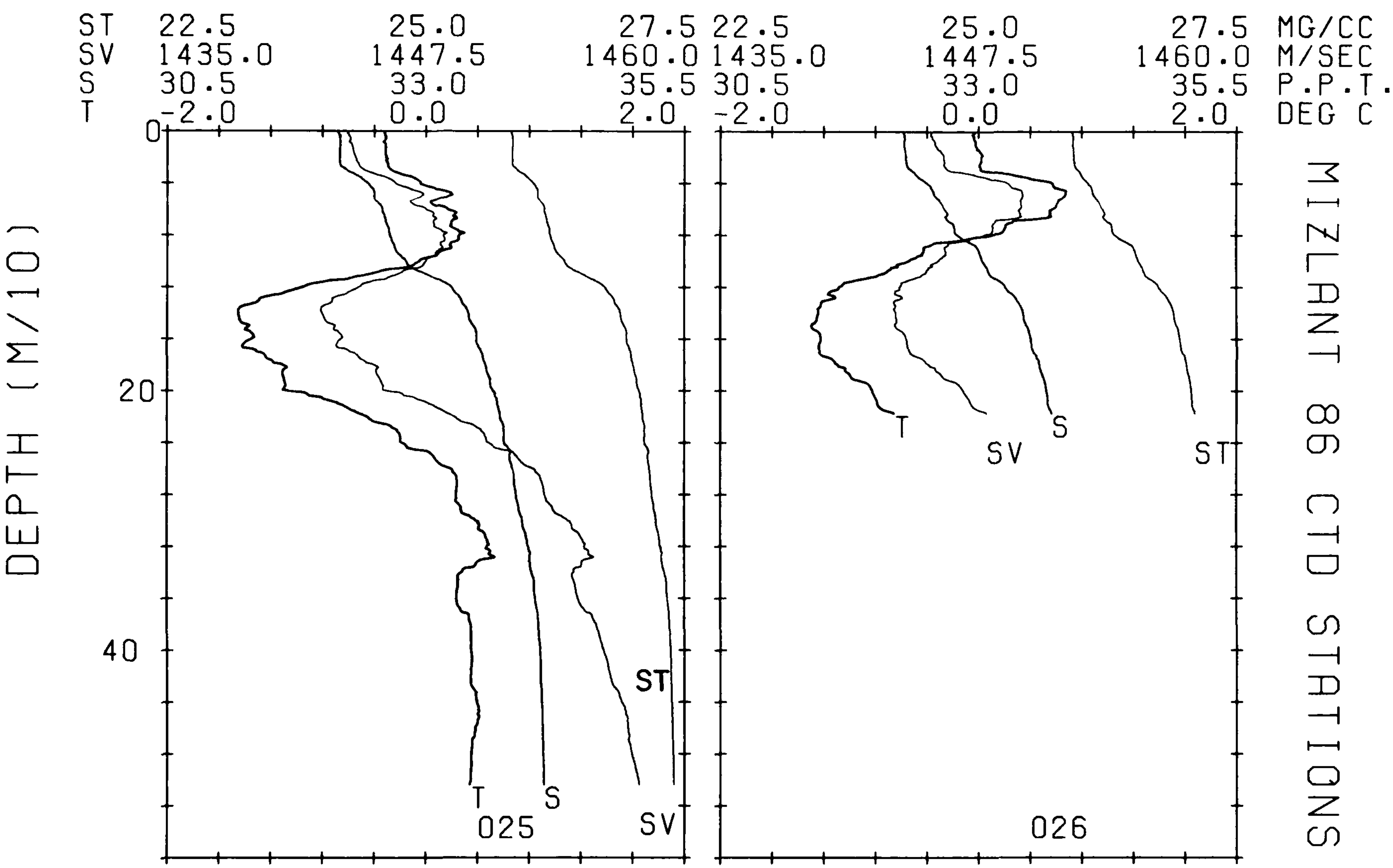
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
S
SV
ST
023
024


MIZLANT 86 CTD STATIONS
DEPTH (M/10)
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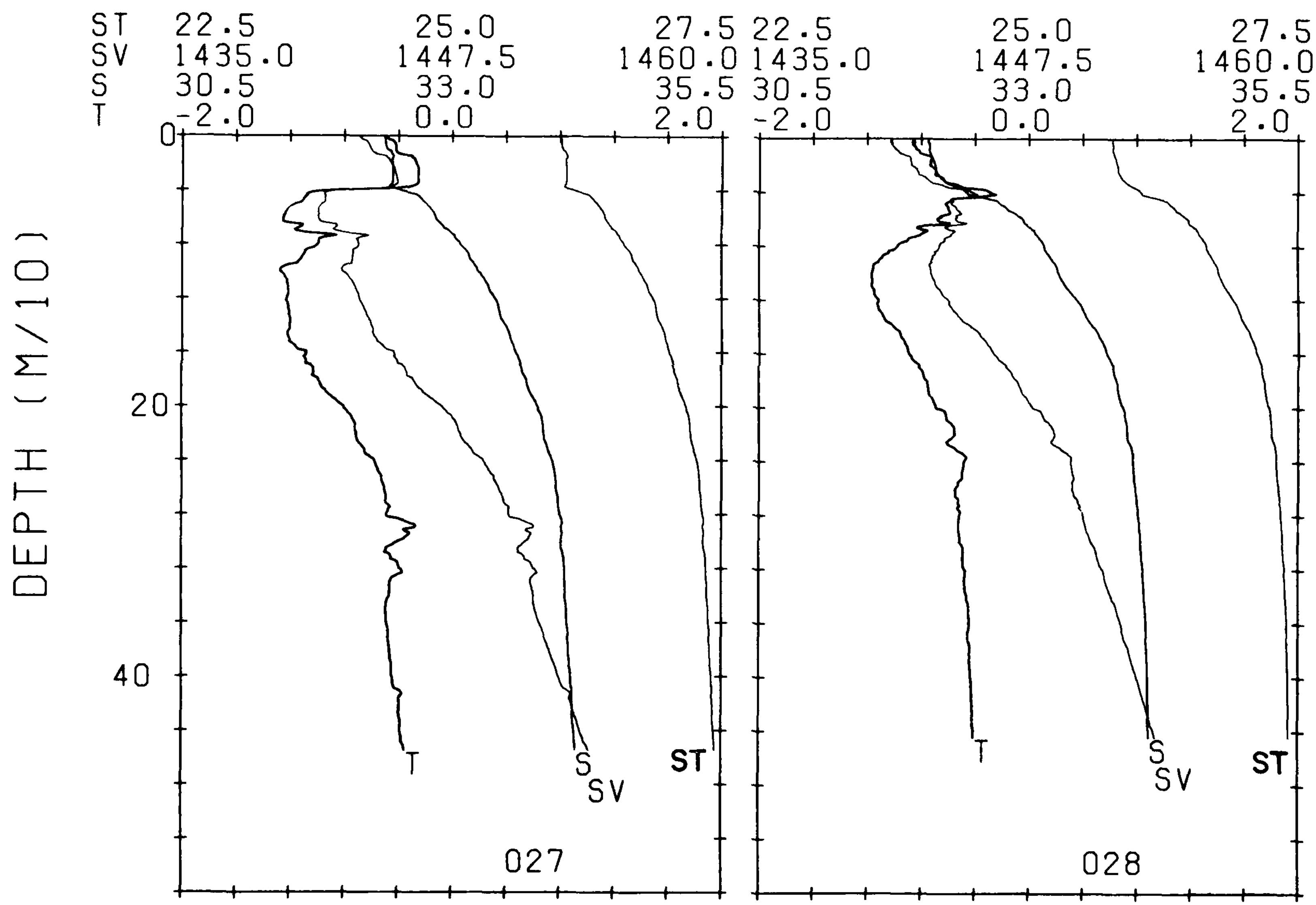
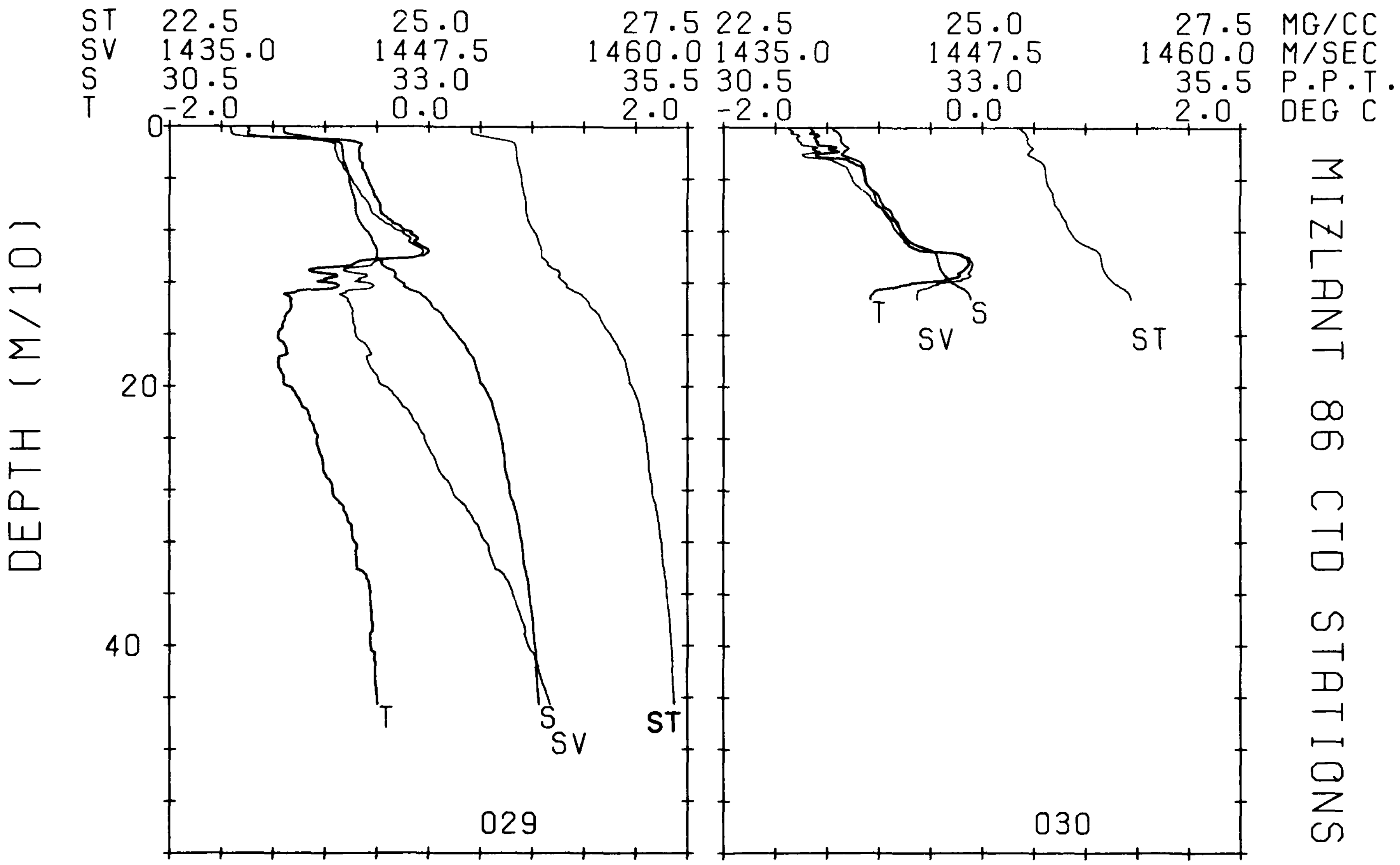
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
0
20
40
T
S
SV
ST
025
026

MIZLANT 86 CTD STATIONS

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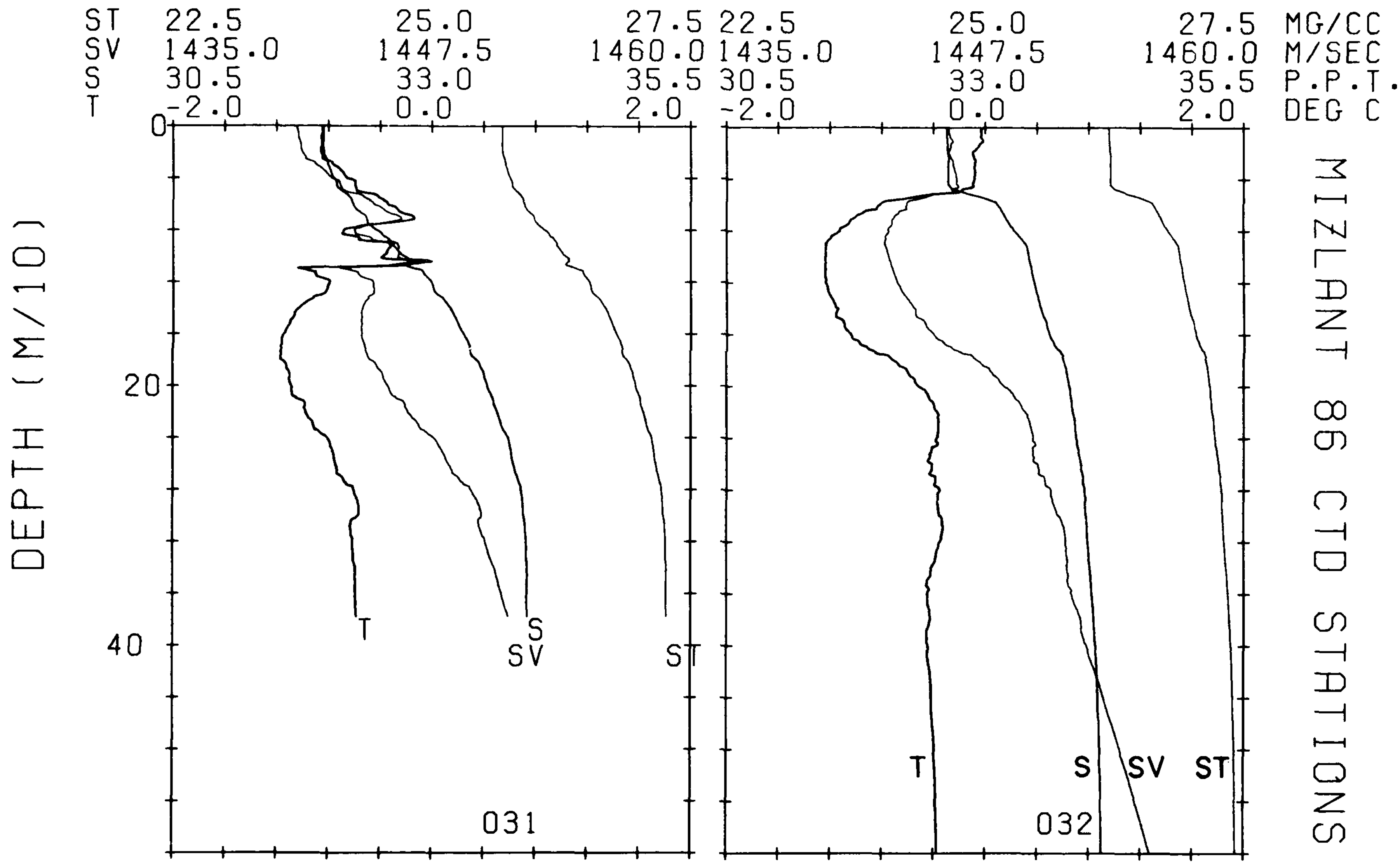
SV 1435.0 1447.5 1460.0
S 30.5 33.0 35.5
T -2.0 0.0 2.0
22.5 25.0 27.5 MG/CC
1435.0 1447.5 1460.0 M/SEC
30.5 33.0 35.5 P.P.T.
-2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
S
SV
ST
029
030



MIZLANT 86 CTD STATIONS
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SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
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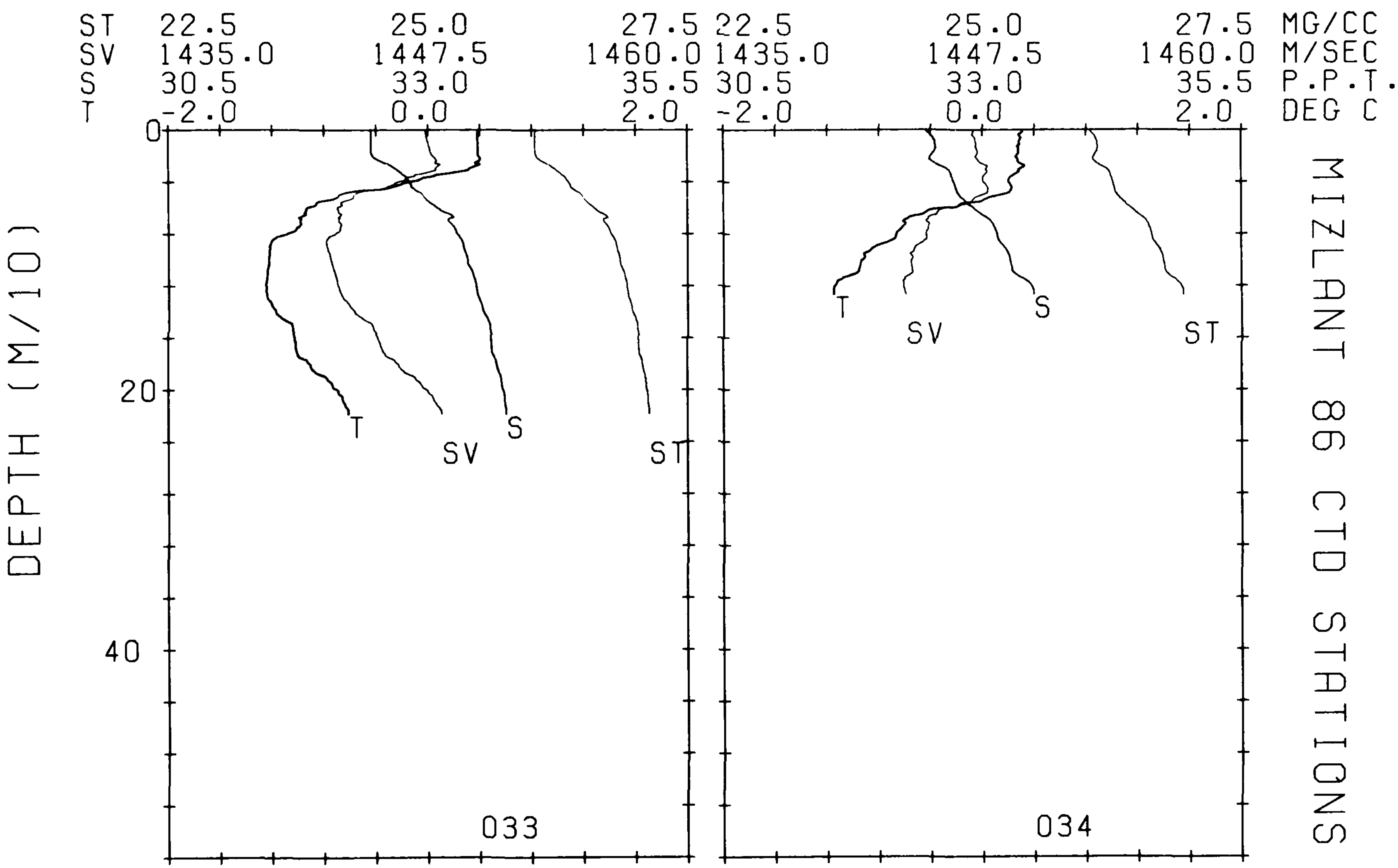
DEPTH (M/10)
0
20
40
T
S
SV
ST
031
032


MIZLANT 86 CTD STATIONS
ST 22.5 25.0 27.5 MG/CC
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S 30.5 33.0 35.5 P.P.T.
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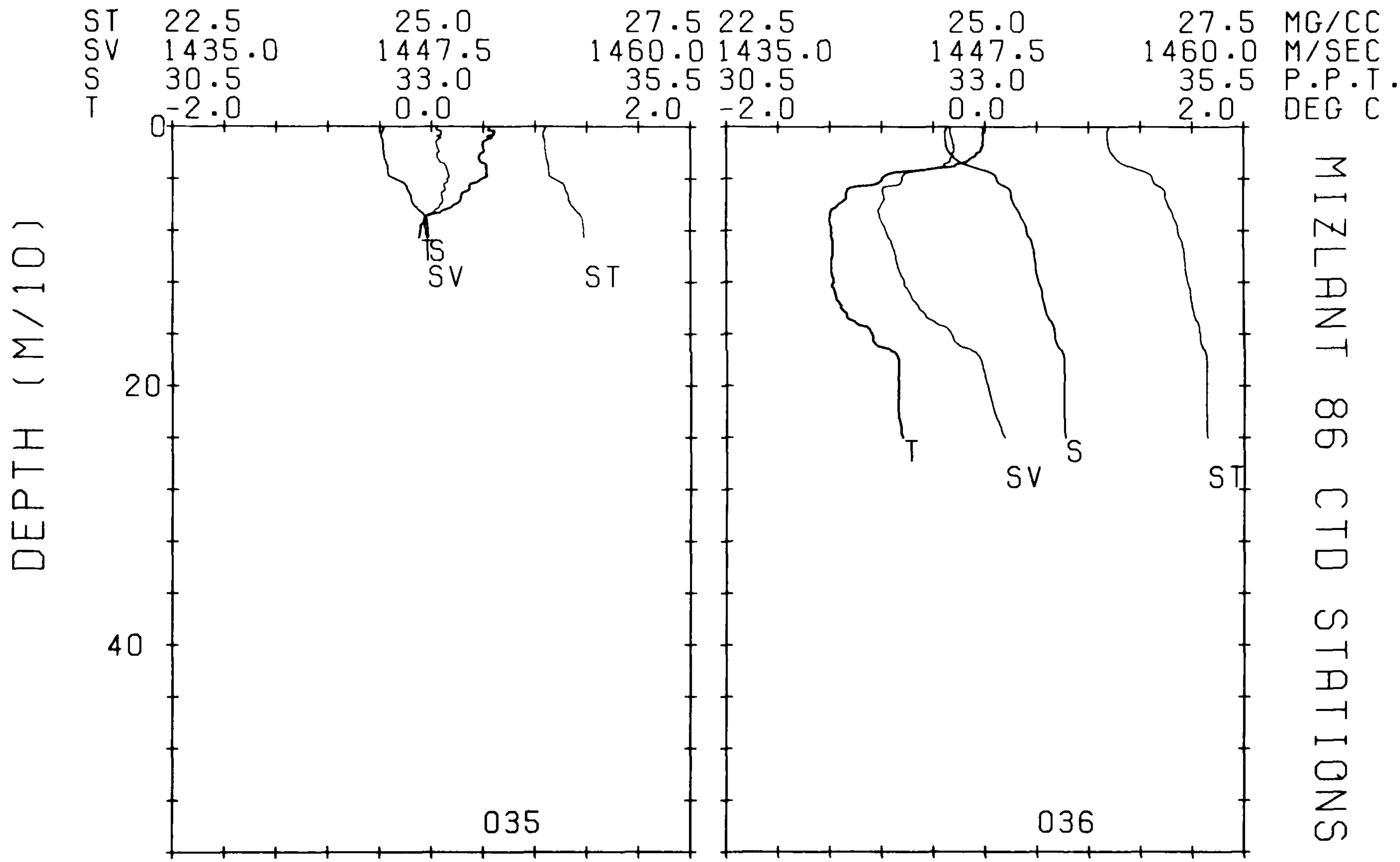
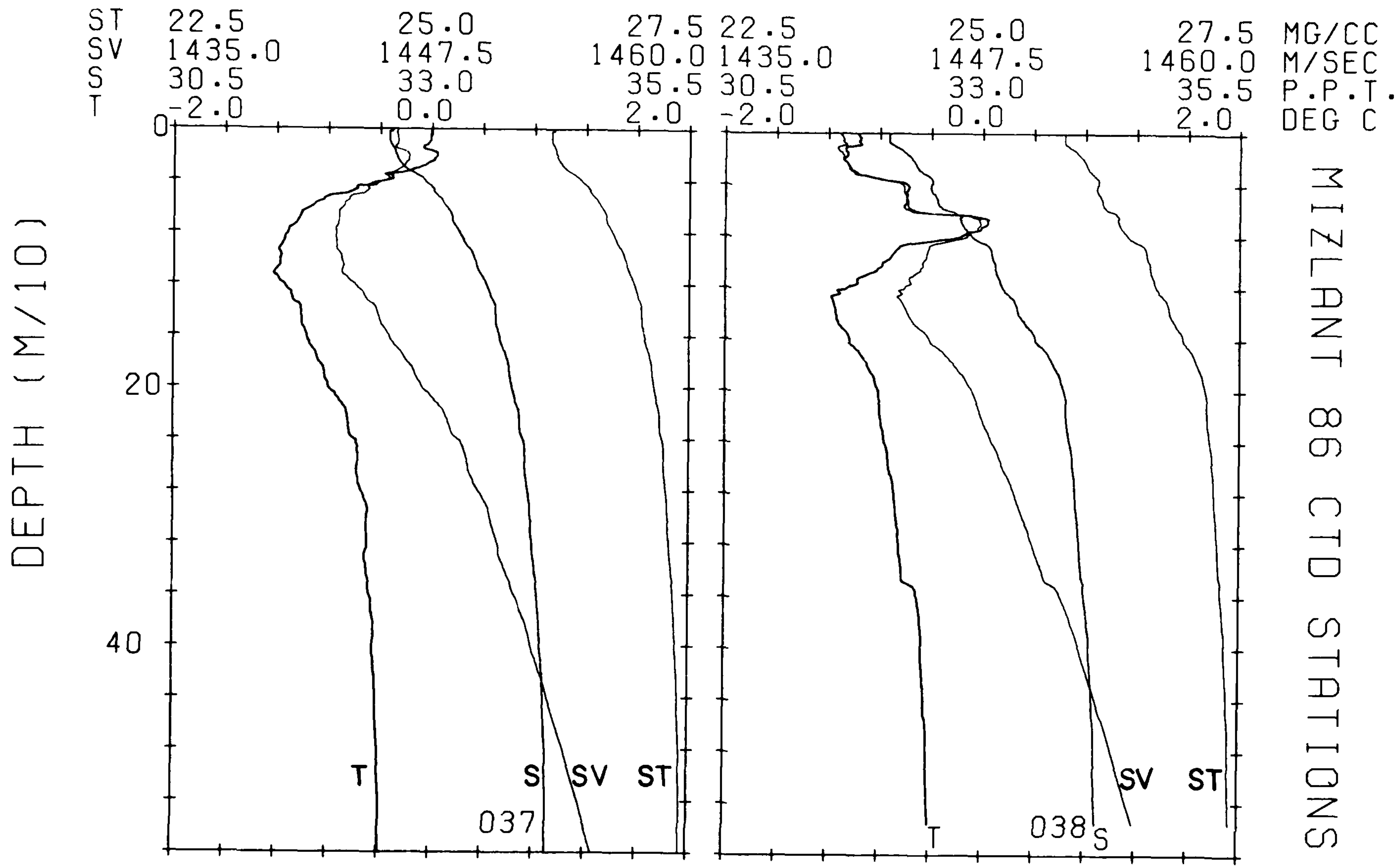
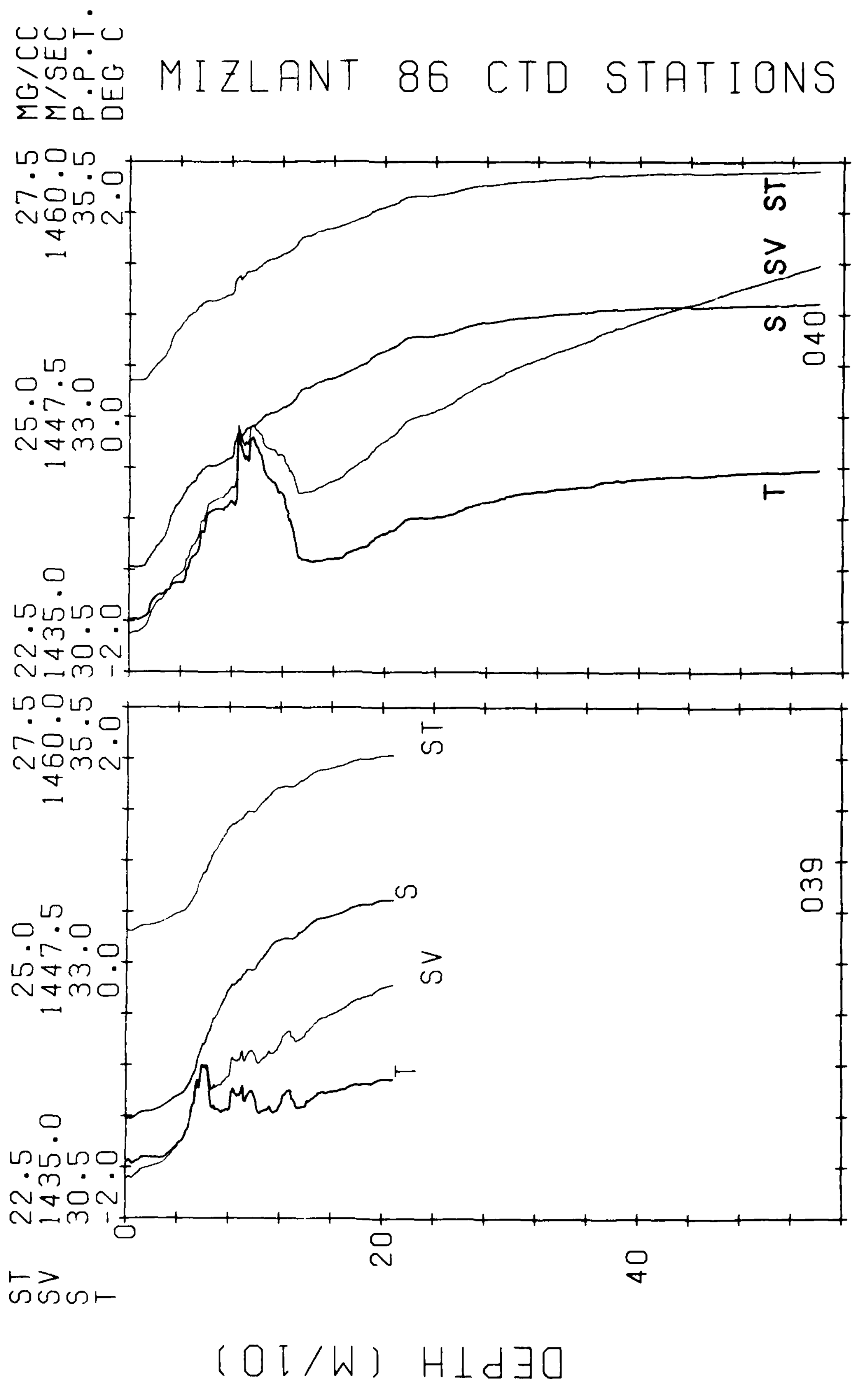
DEPTH (M/10)
0
20
40
T
SV
S
ST
033
034

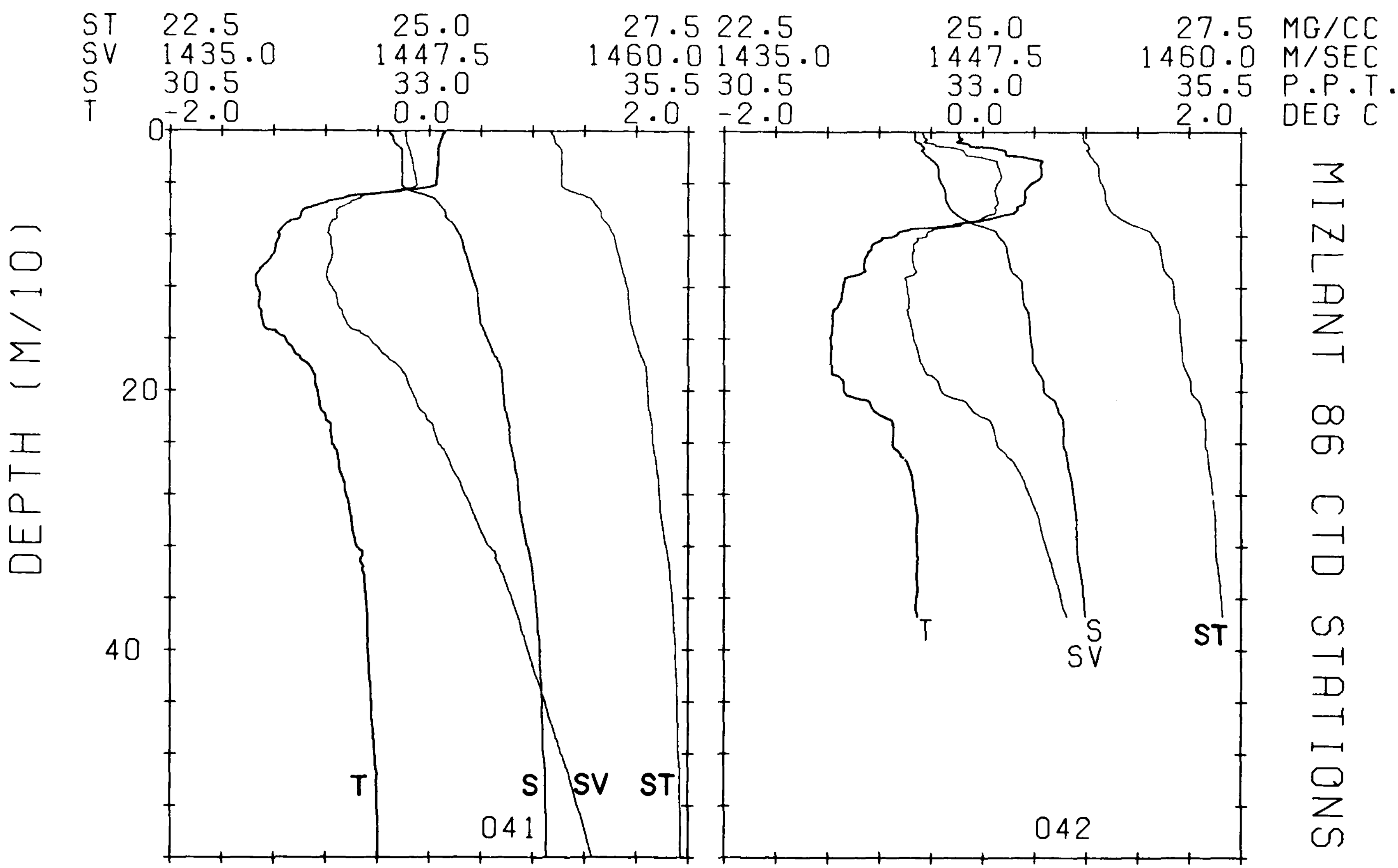


MIZLANT 86 CTD STATIONS
DEPTH (M/10)
ST
SV
S
T
22.5
1435.0
30.5
-2.0
25.0
1447.5
33.0
0.0
27.5
1460.0
35.5
2.0
MG/CC
M/SEC
P.P.T.
DEG C
0
20
40
035
036


MIZLANT 86 CTD STATIONS
ST 22.5 25.0 27.5 MG/CC
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
T
S
SV
ST
037
038

MIZLANT 86 CTD STATIONS





MIZLANT 86 CTD STATIONS
DEPTH (M/10)
ST SV S T
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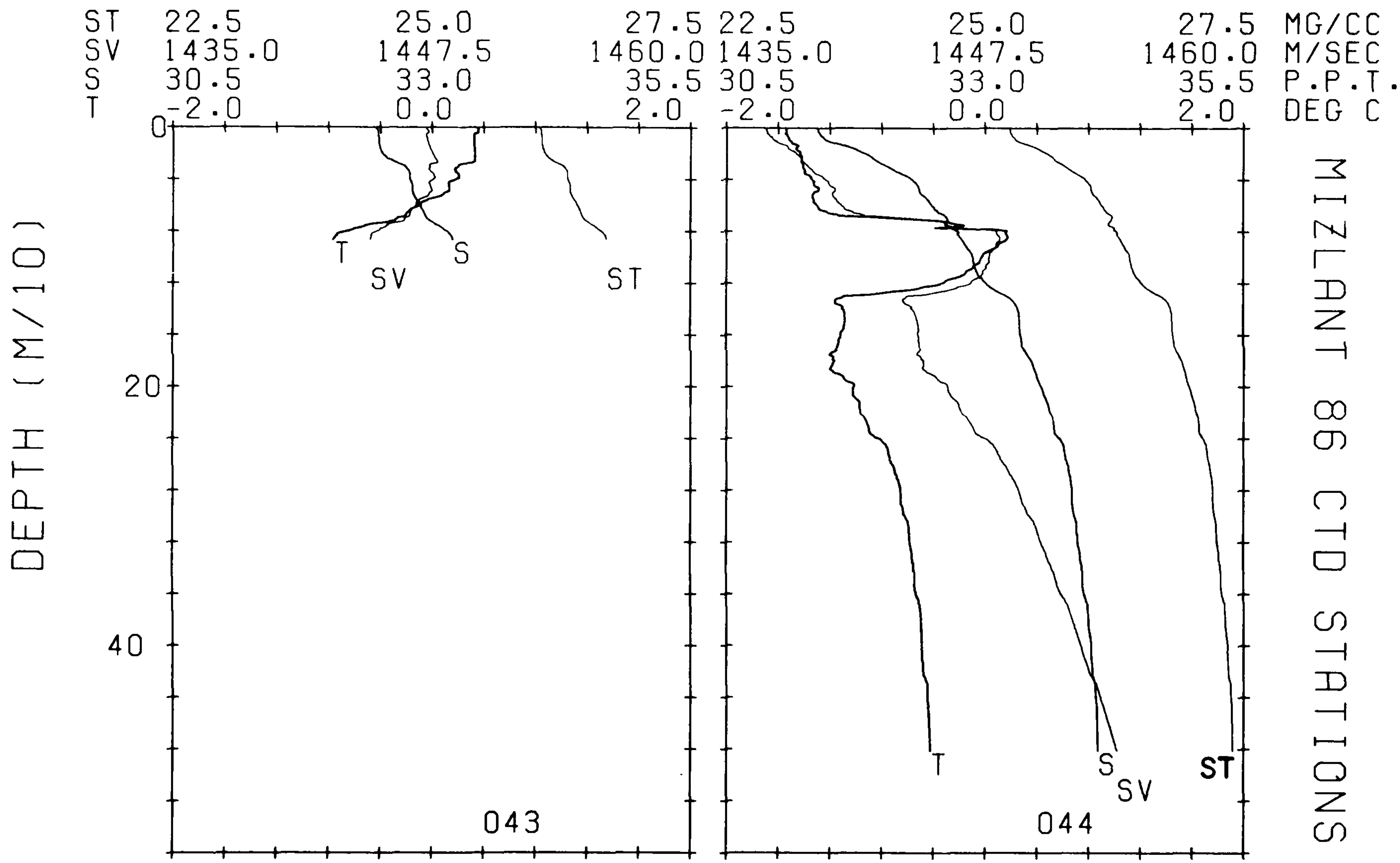
25.0 1447.5 33.0 0.0
27.5 1460.0 35.5 2.0
MG/CC M/SEC P.P.T. DEG C
0
20
40
T S SV ST
041
042



MIZLANT 86 CTD STATIONS
DEPTH (M/10)
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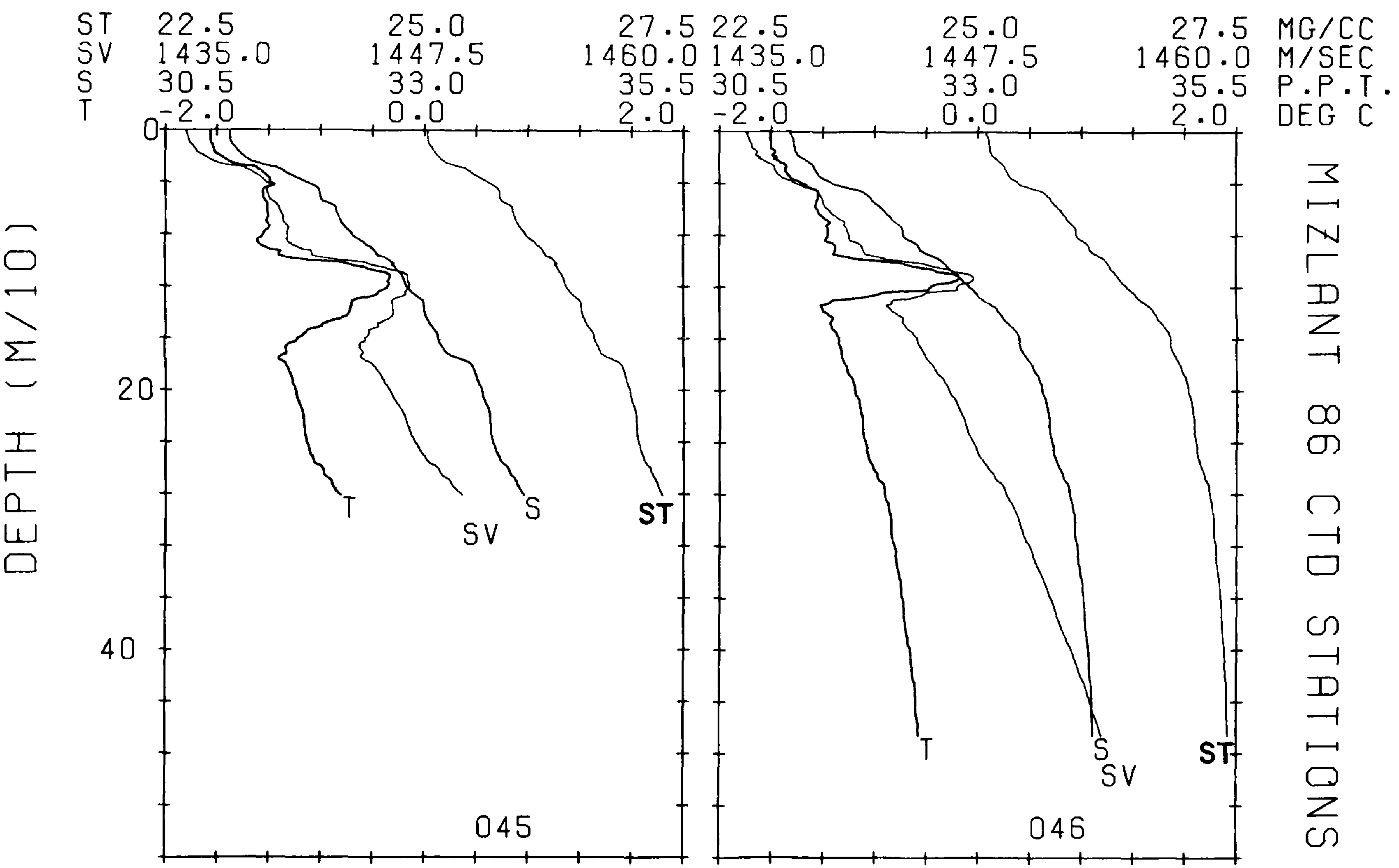
SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 DEG C
0
20
40
T
SV
S
ST
043
044



MIZLANT 86 CTD STATIONS
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SV 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 P.P.T.
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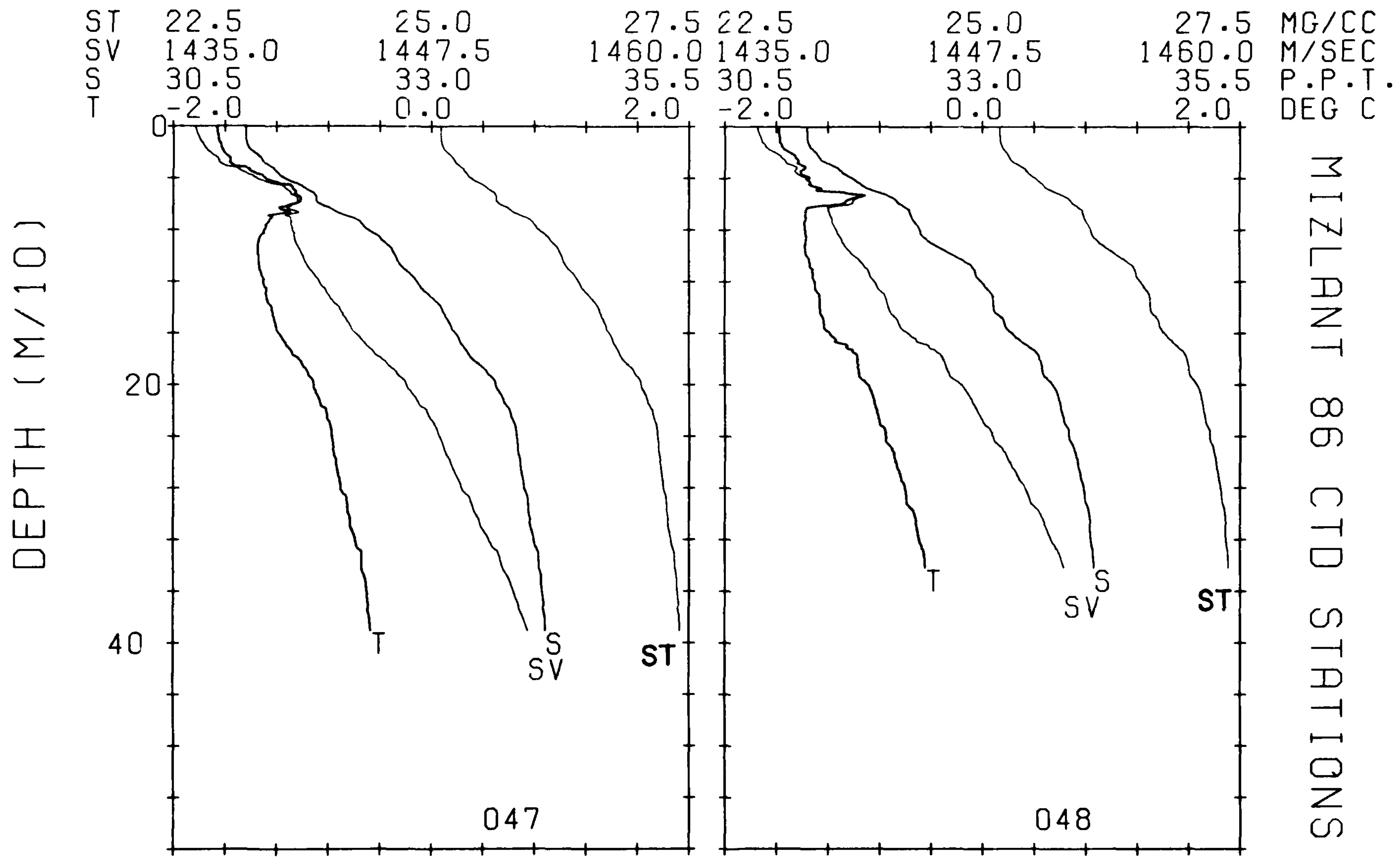
DEPTH (M/10)
0
20
40
T
SV
S
ST
045
046



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DEPTH (M/10)
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SV
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T
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33.0
0.0
27.5
1460.0
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MG/CC
M/SEC
P.P.T.
DEG C
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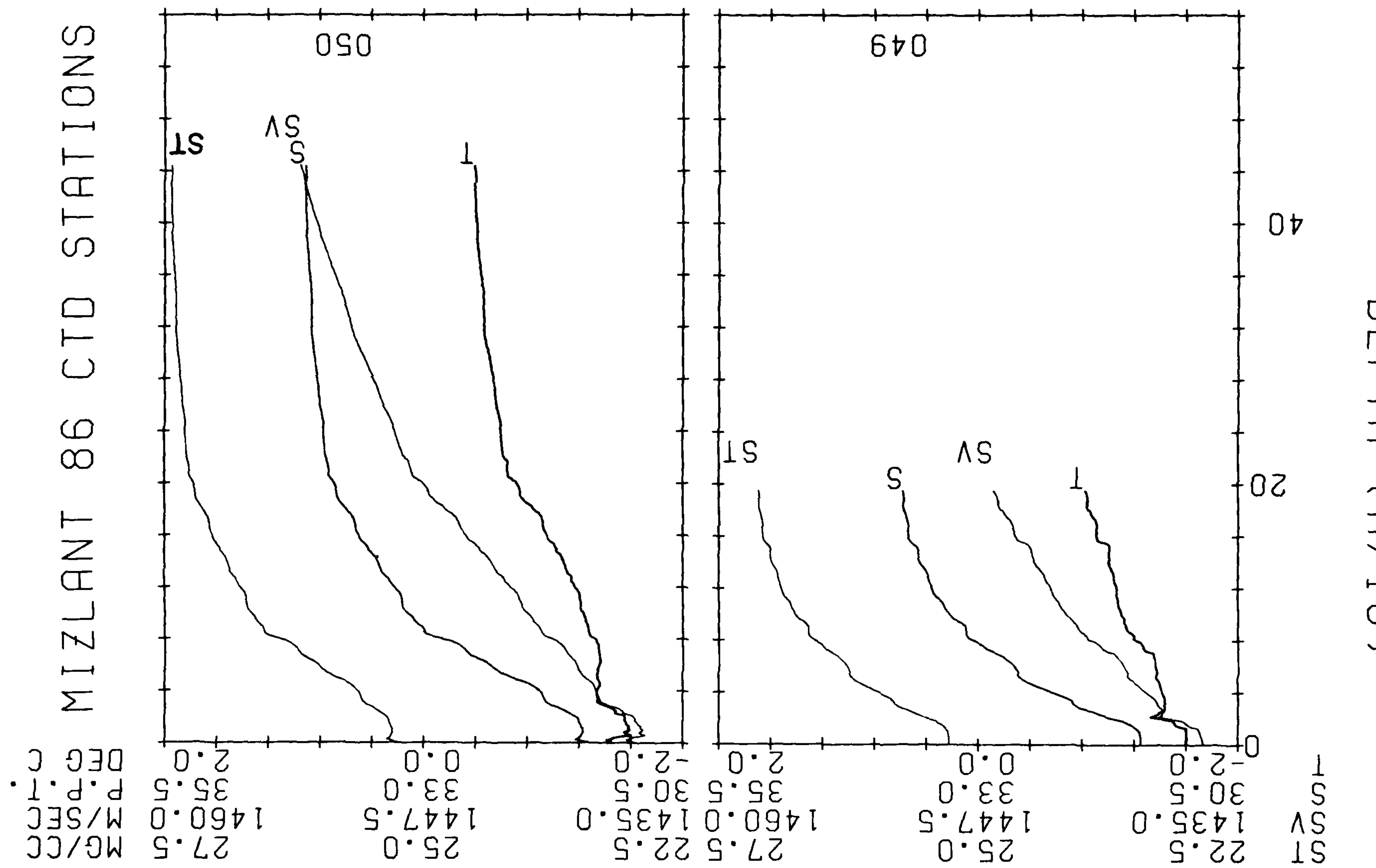
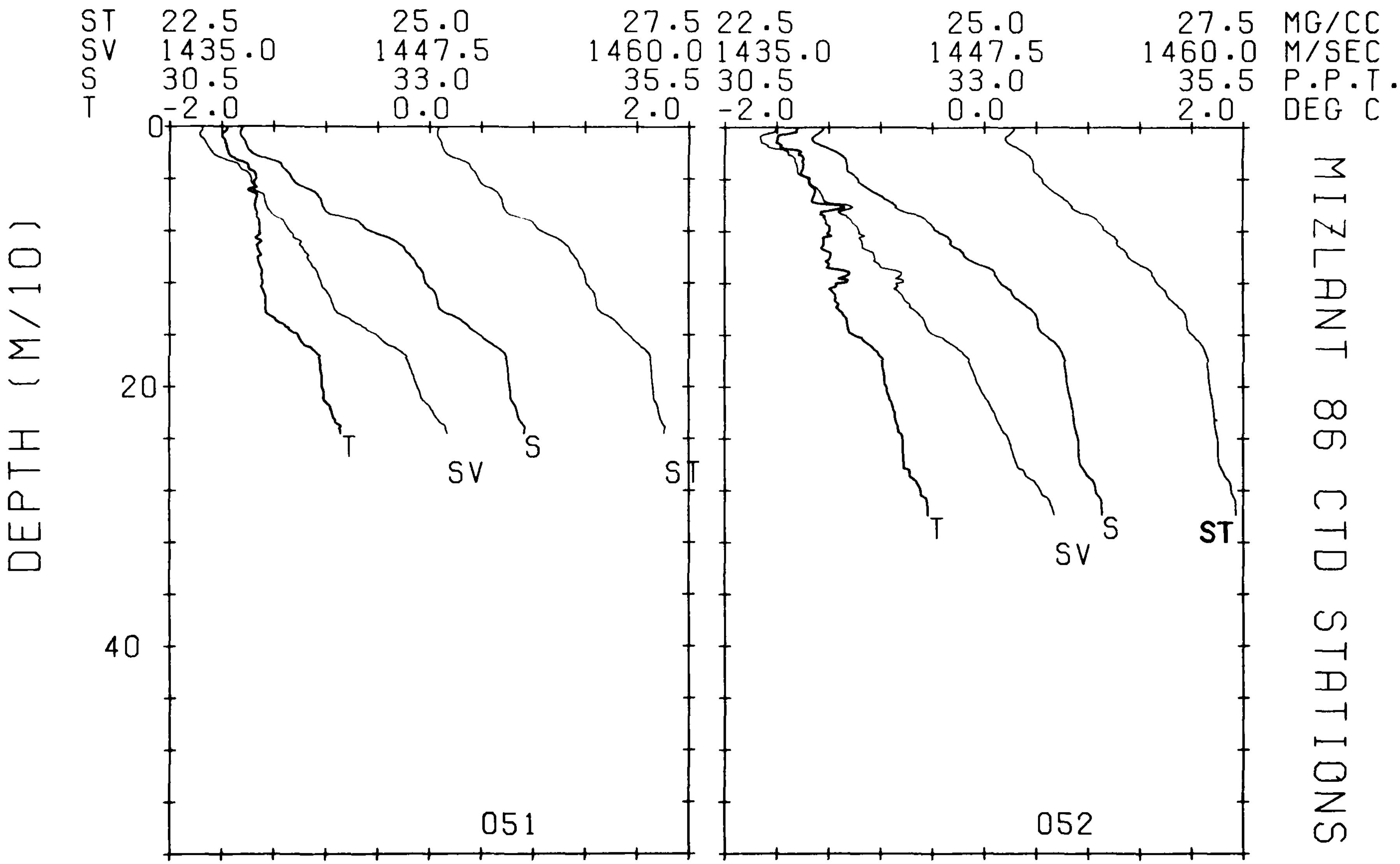
20
40
047
048

MIZLANT 86 CTD STATIONS

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DEPTH (M/10)
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20
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S
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051
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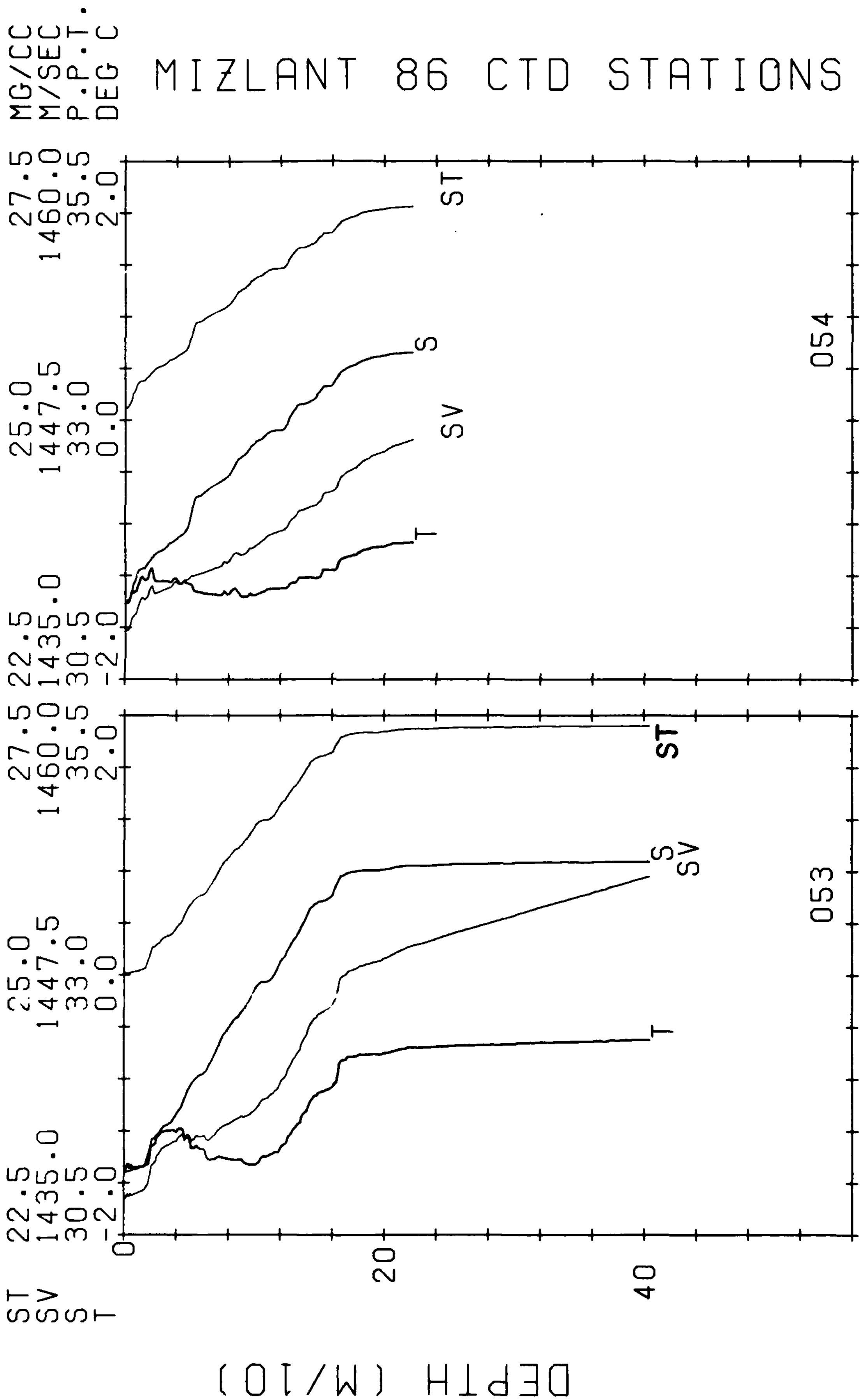

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SV
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053
054
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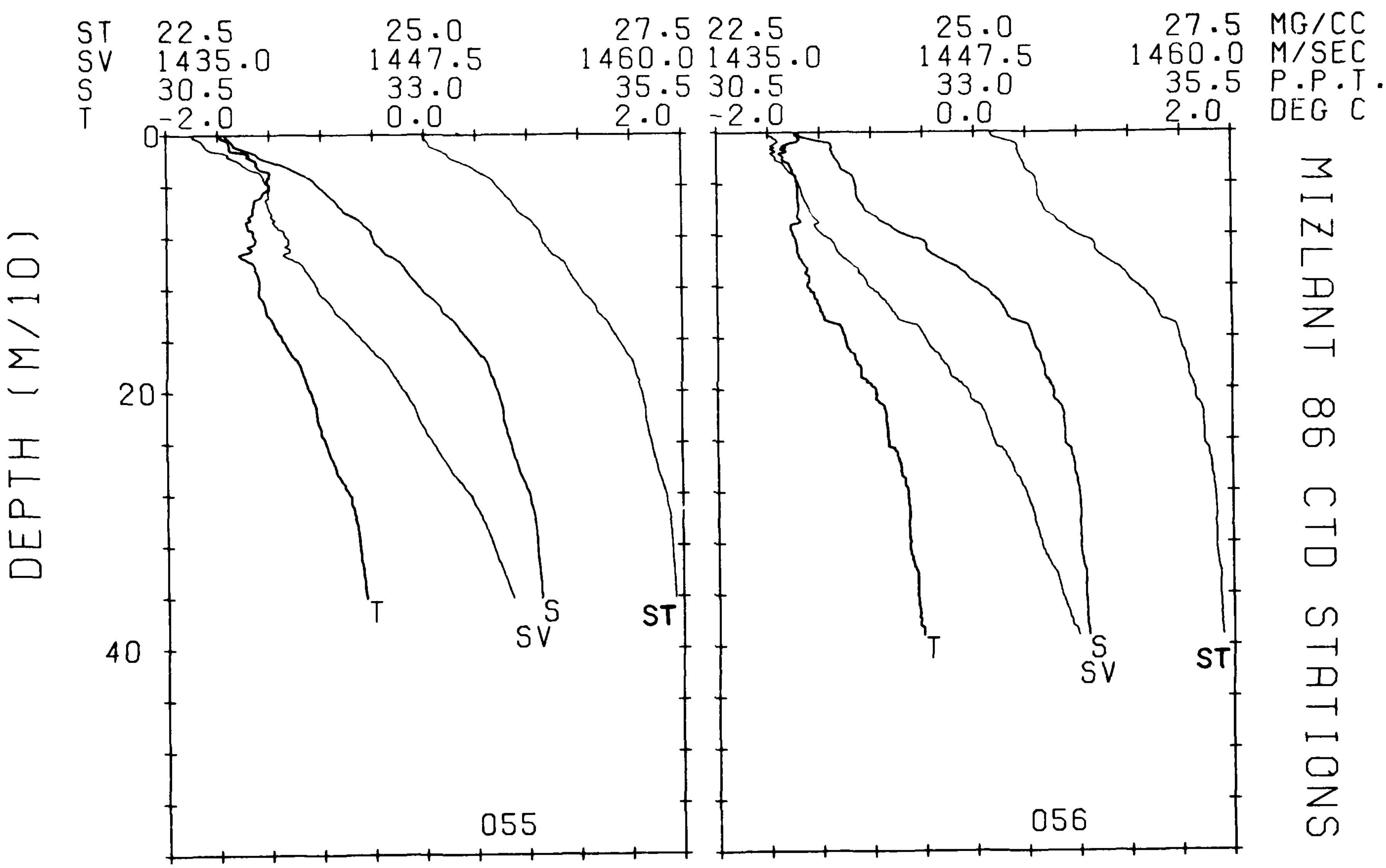
DEPTH (M/10)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27.5
1460.0
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M/SEC
P.P.T.
DEG C
DEPTH (M/10)
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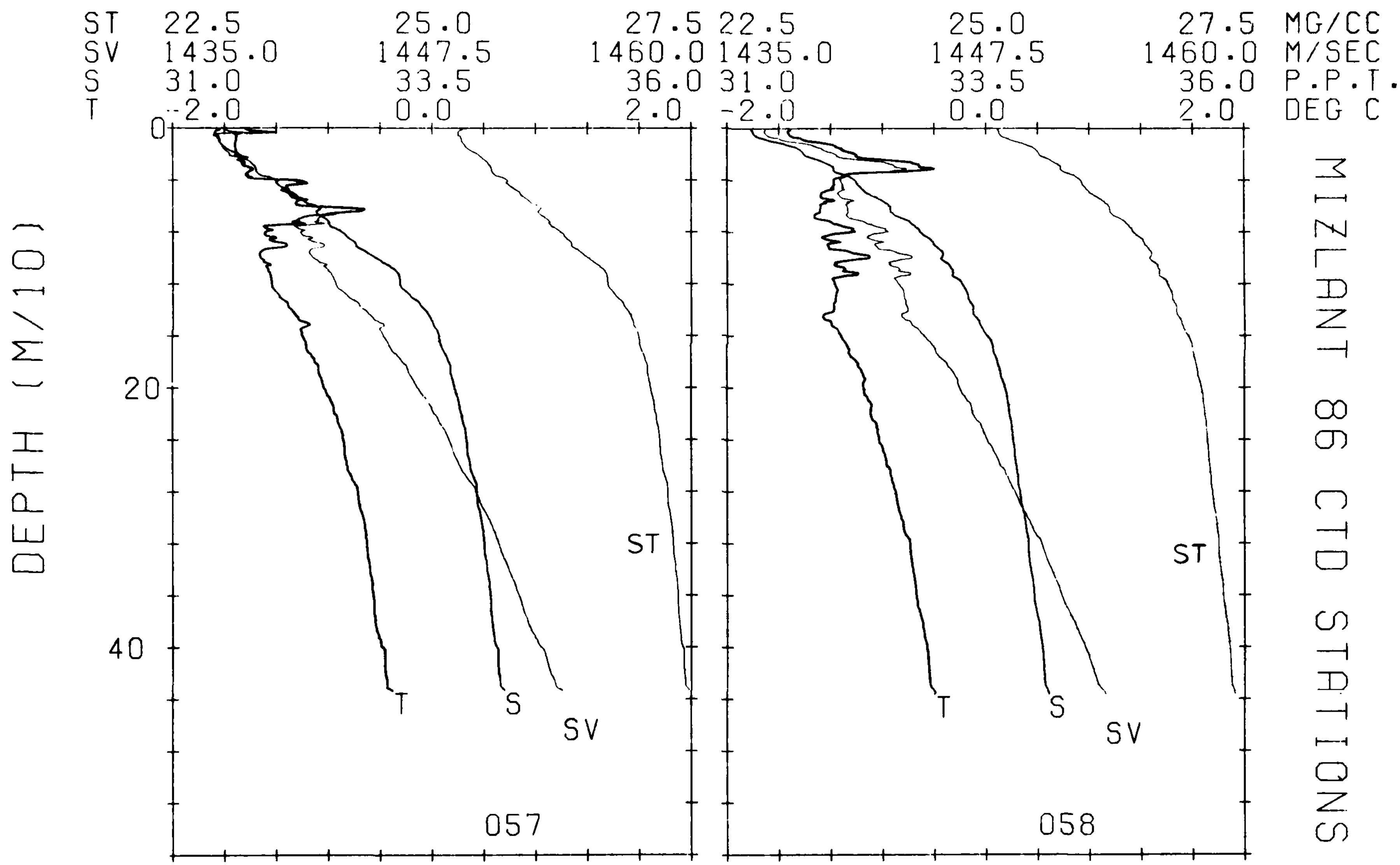
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SV
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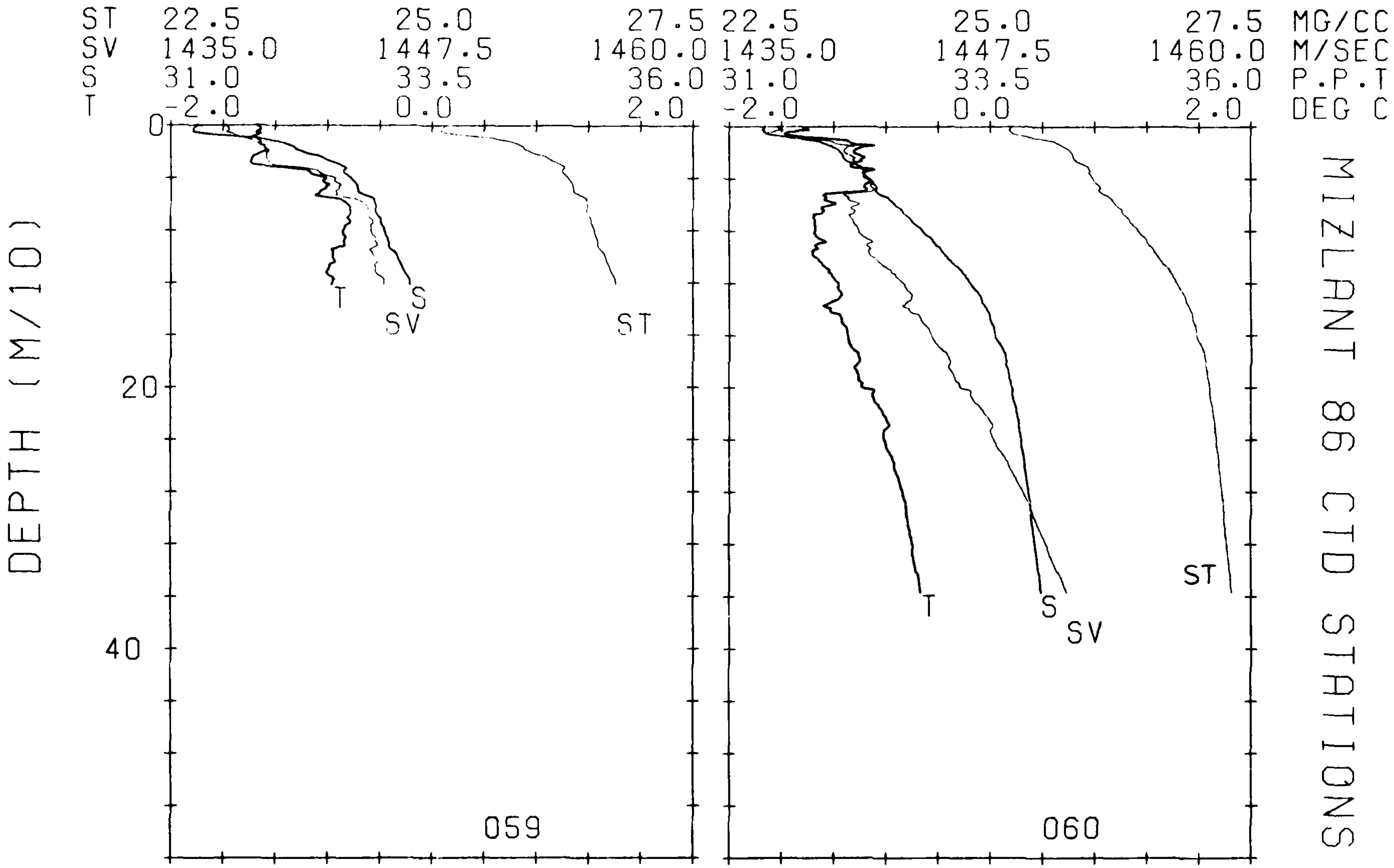
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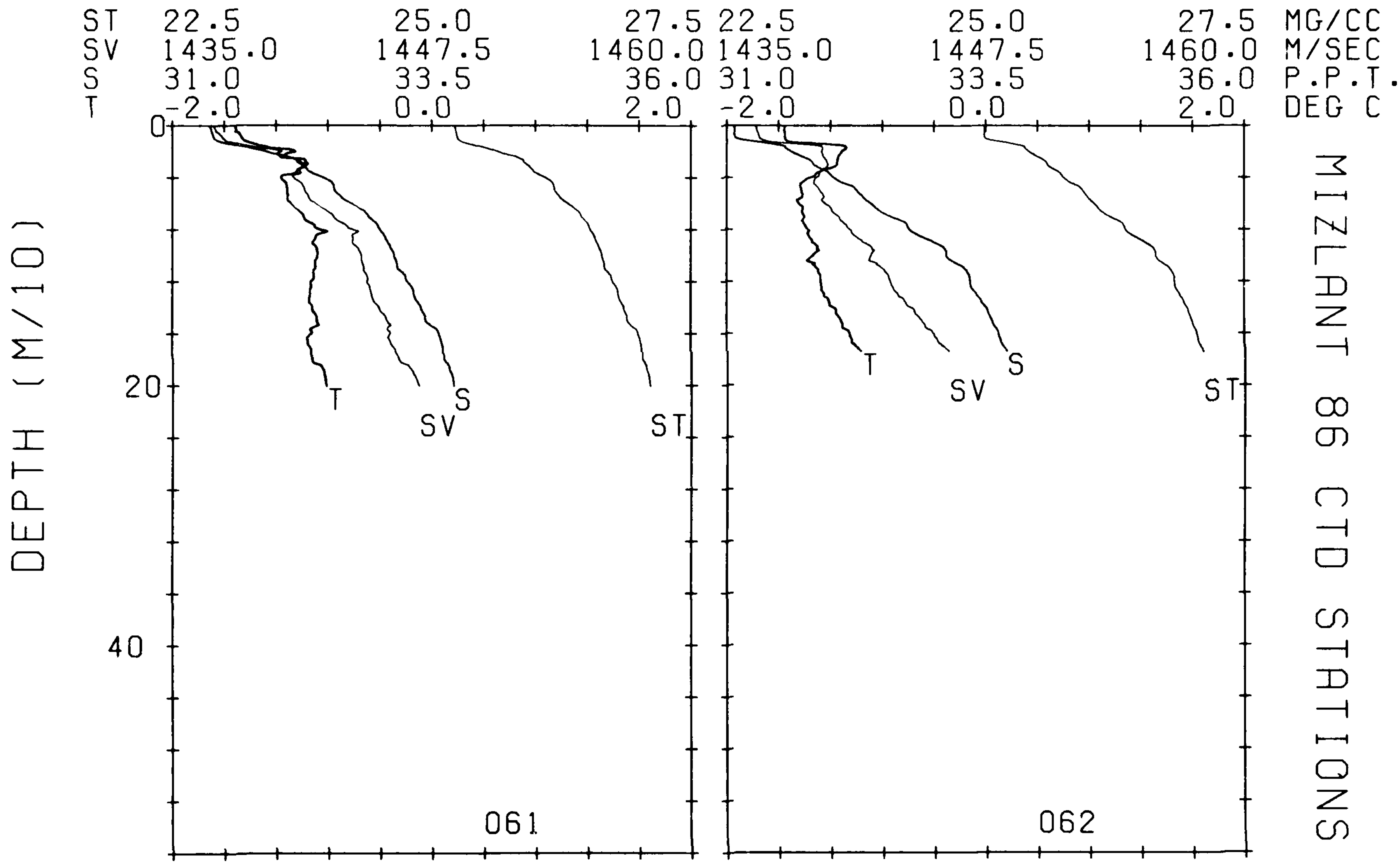

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S 31.0 33.5 36.0 P.P.T.
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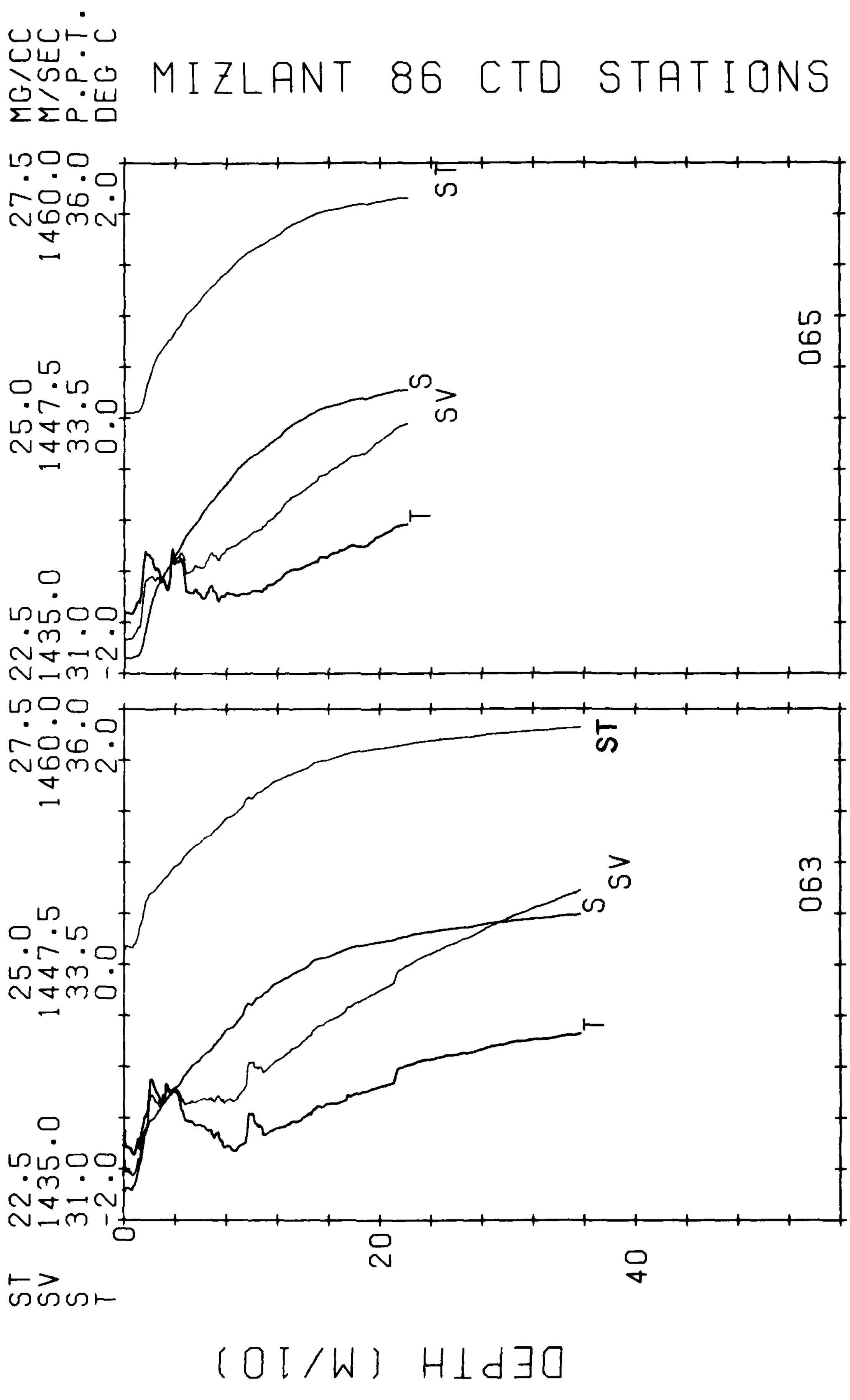

MIZLANT 86 CTD STATIONS
MG/CC
M/SEC
P.P.T.
DEG C
27.5
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36.0
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33.5
0.0
22.5
1435.0
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063
ST
SV
S
T
0
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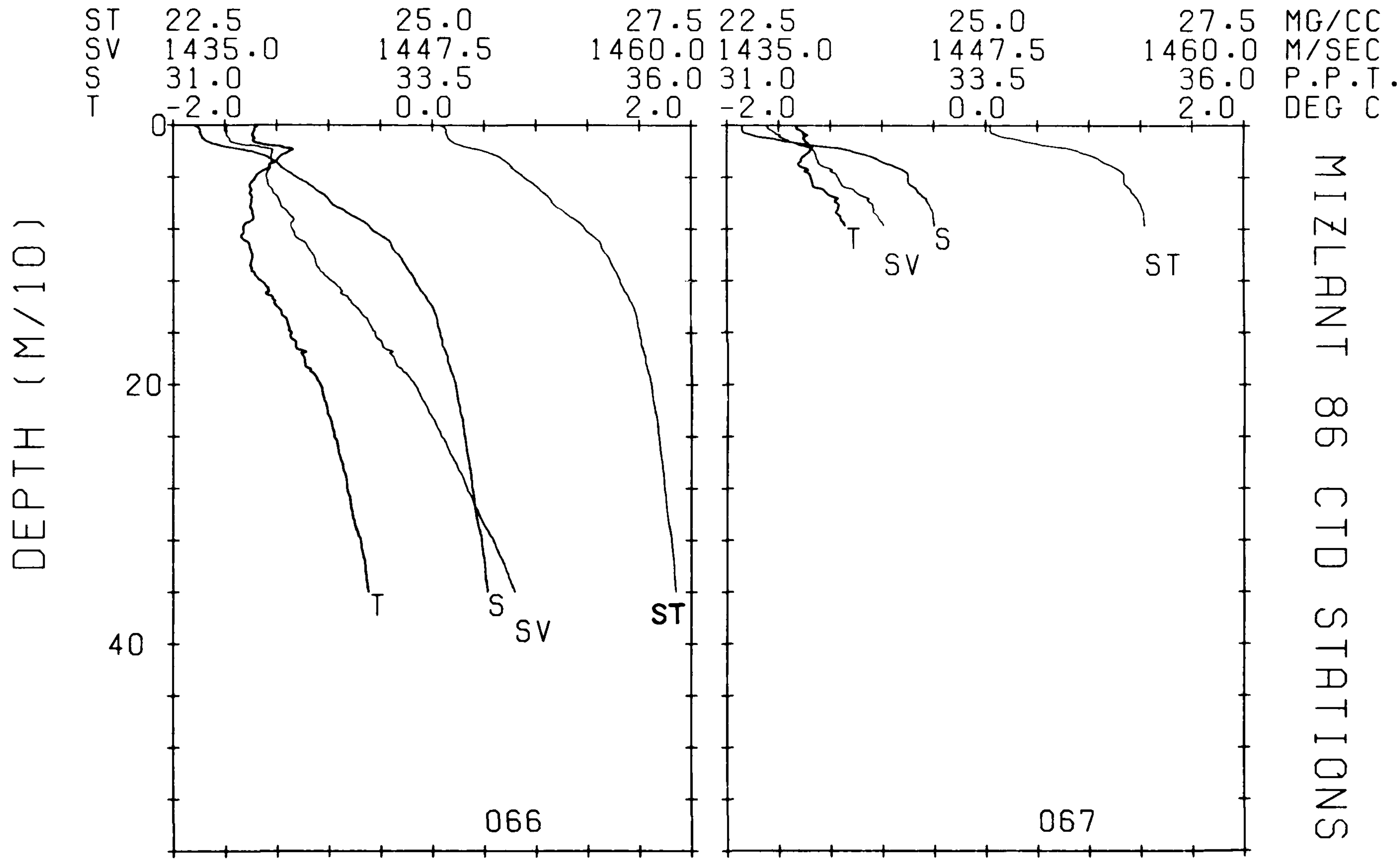
40
DEPTH (M/10)



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SV
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-2.0
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33.5
0.0
27.5
1460.0
36.0
2.0
MG/CC
M/SEC
P.P.T.
DEG C
DEPTH (M/10)
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T
S
SV
ST
066
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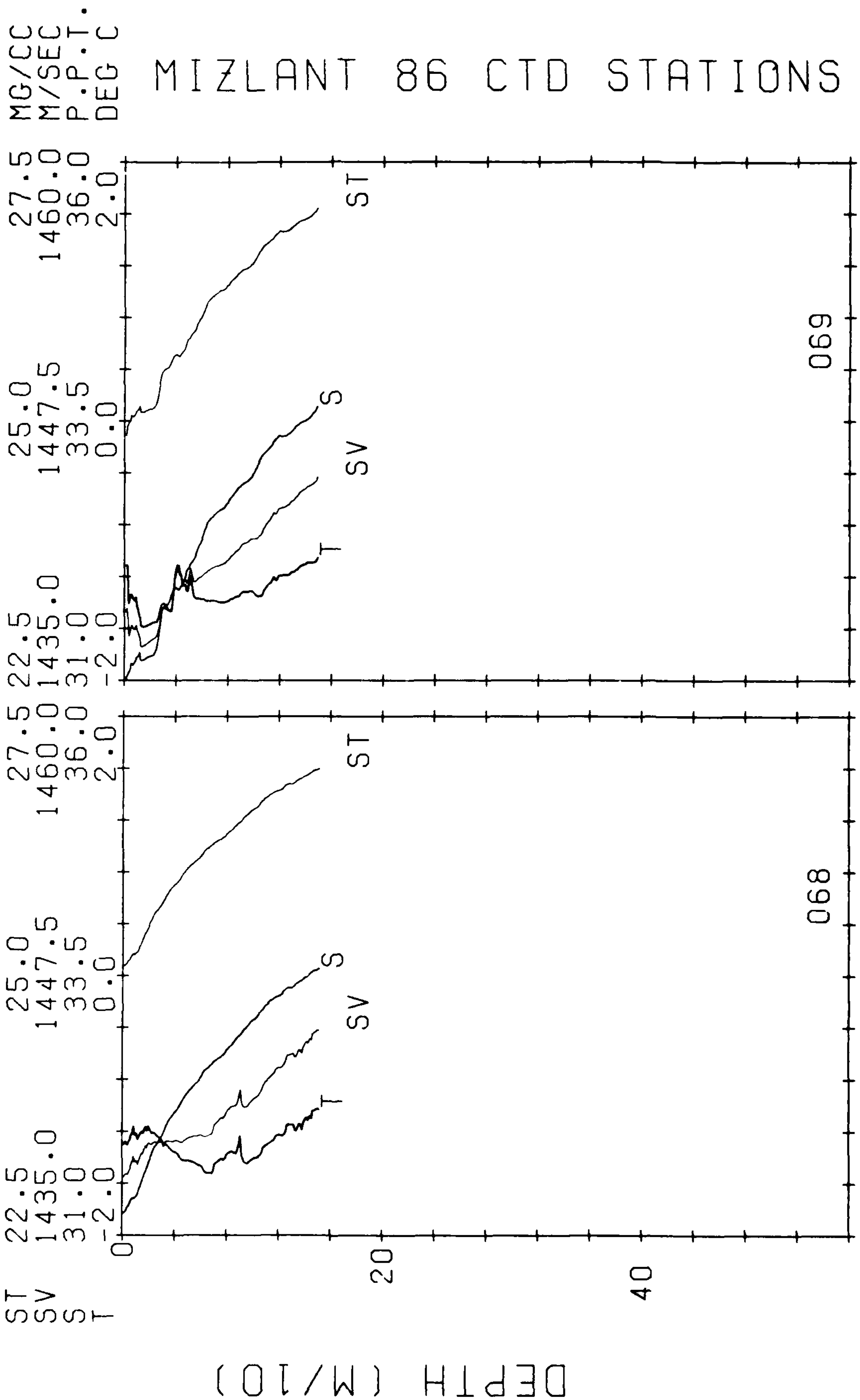
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T
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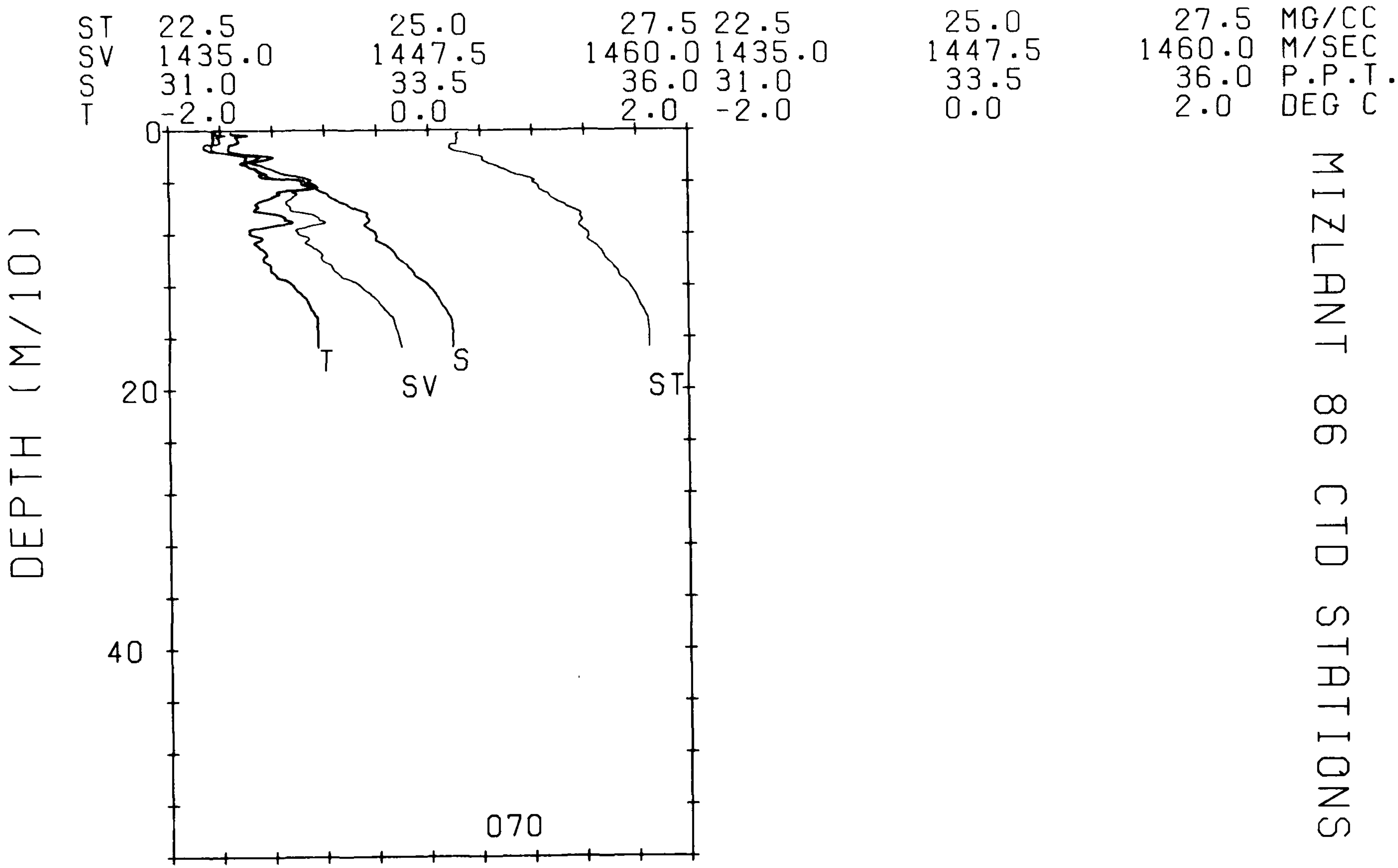
DEPTH (M/10)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DEPTH (M/10)
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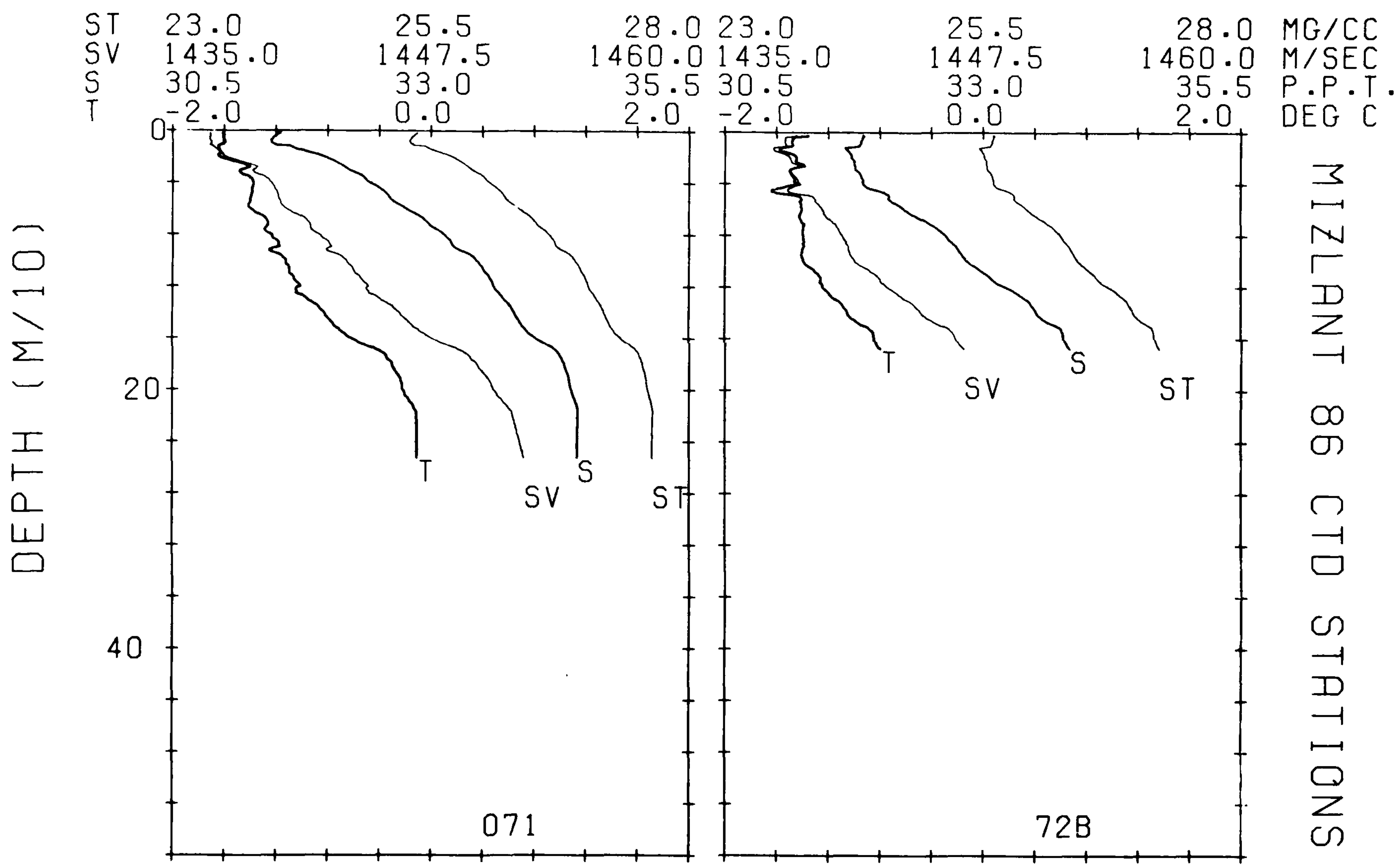
SV
S
ST
070
MIZLANT 86 CTD STATIONS



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SV
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0.0
28.0
1460.0
35.5
2.0
MG/CC
M/SEC
P.P.T.
DEG C
DEPTH (M/10)
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40
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SV
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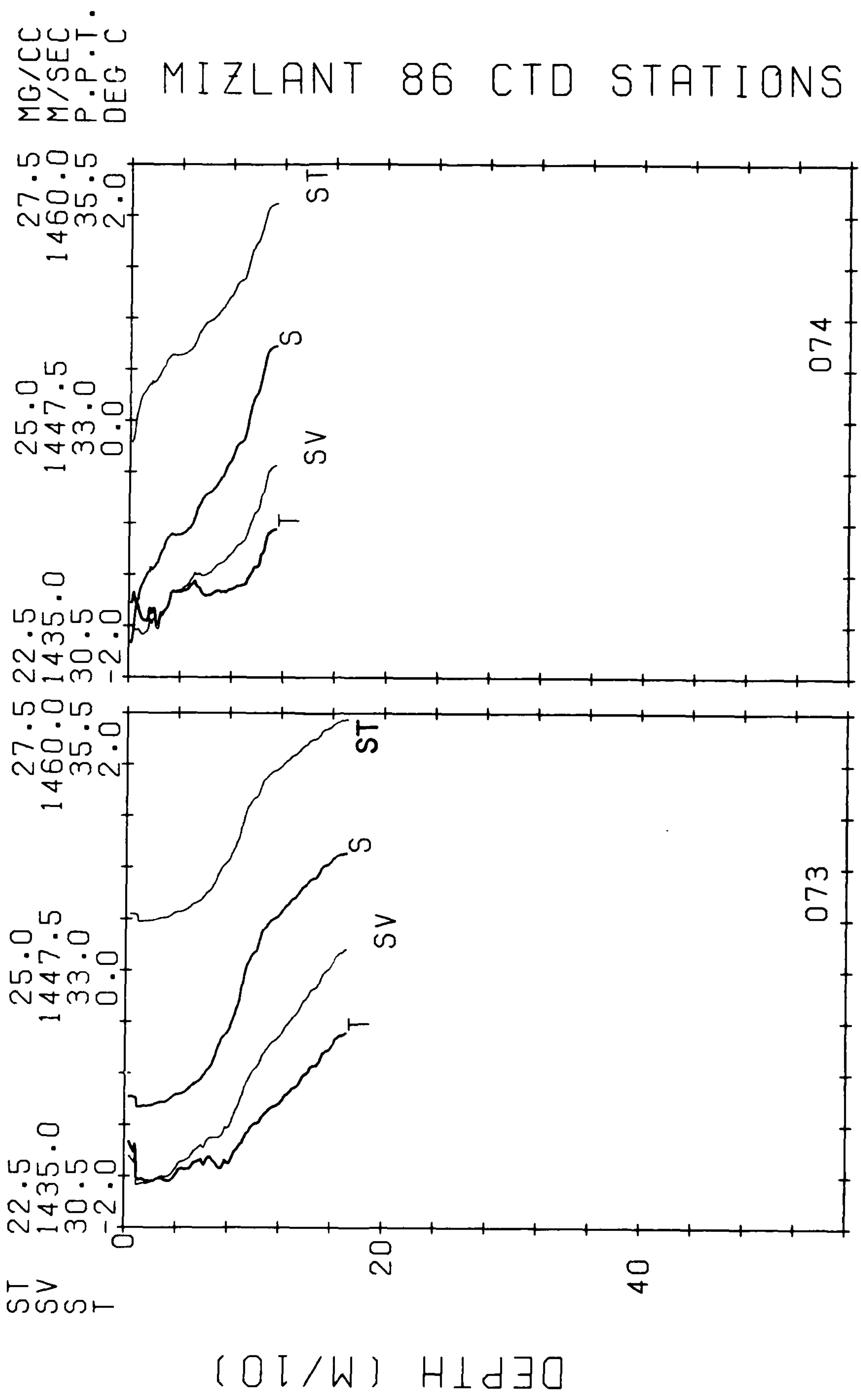

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MG/CC
M/SEC
P.P.T.
DEG C
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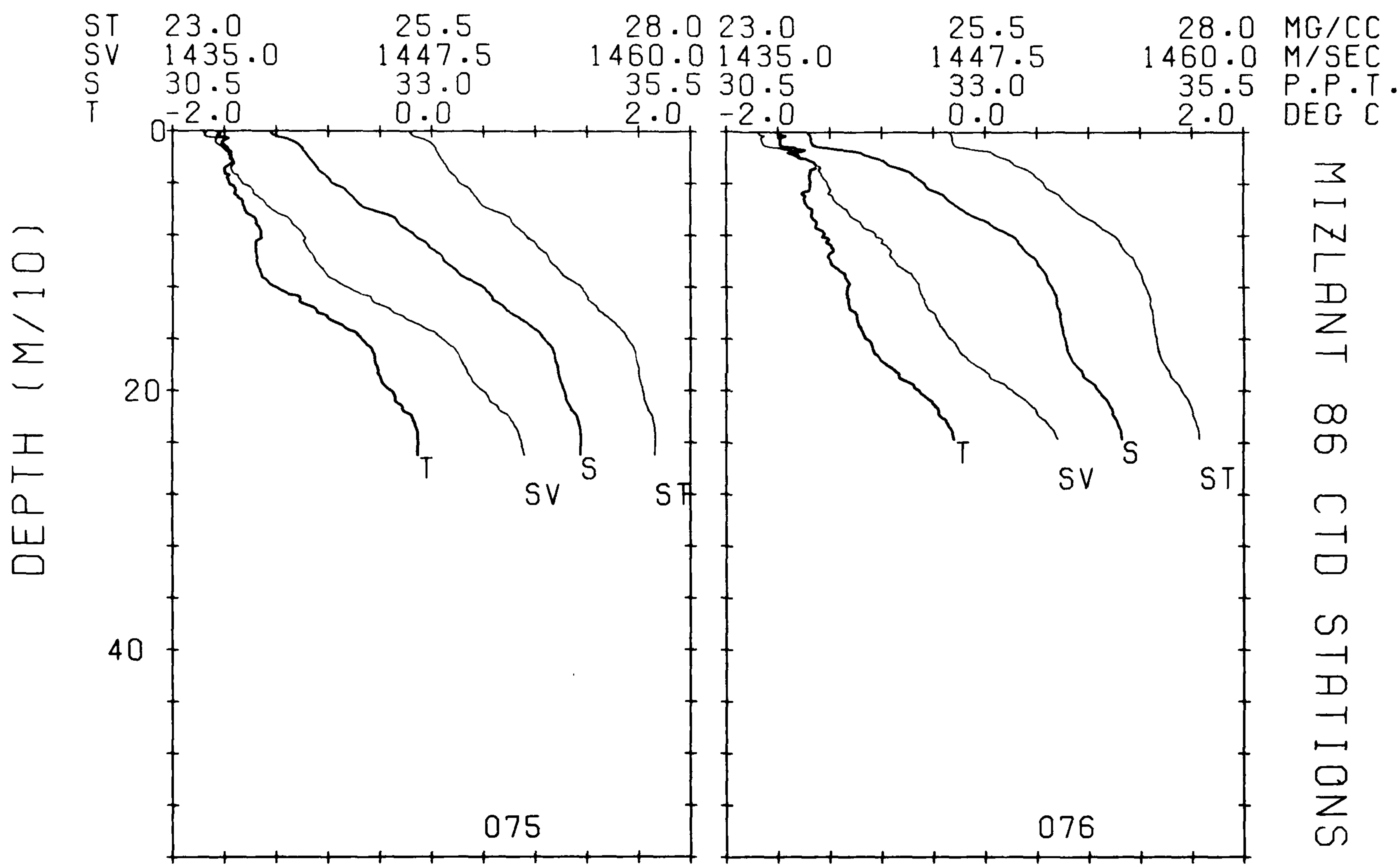
S
SV
T
074
073
0
20
40
DEPTH (M/10)



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SV
S
ST
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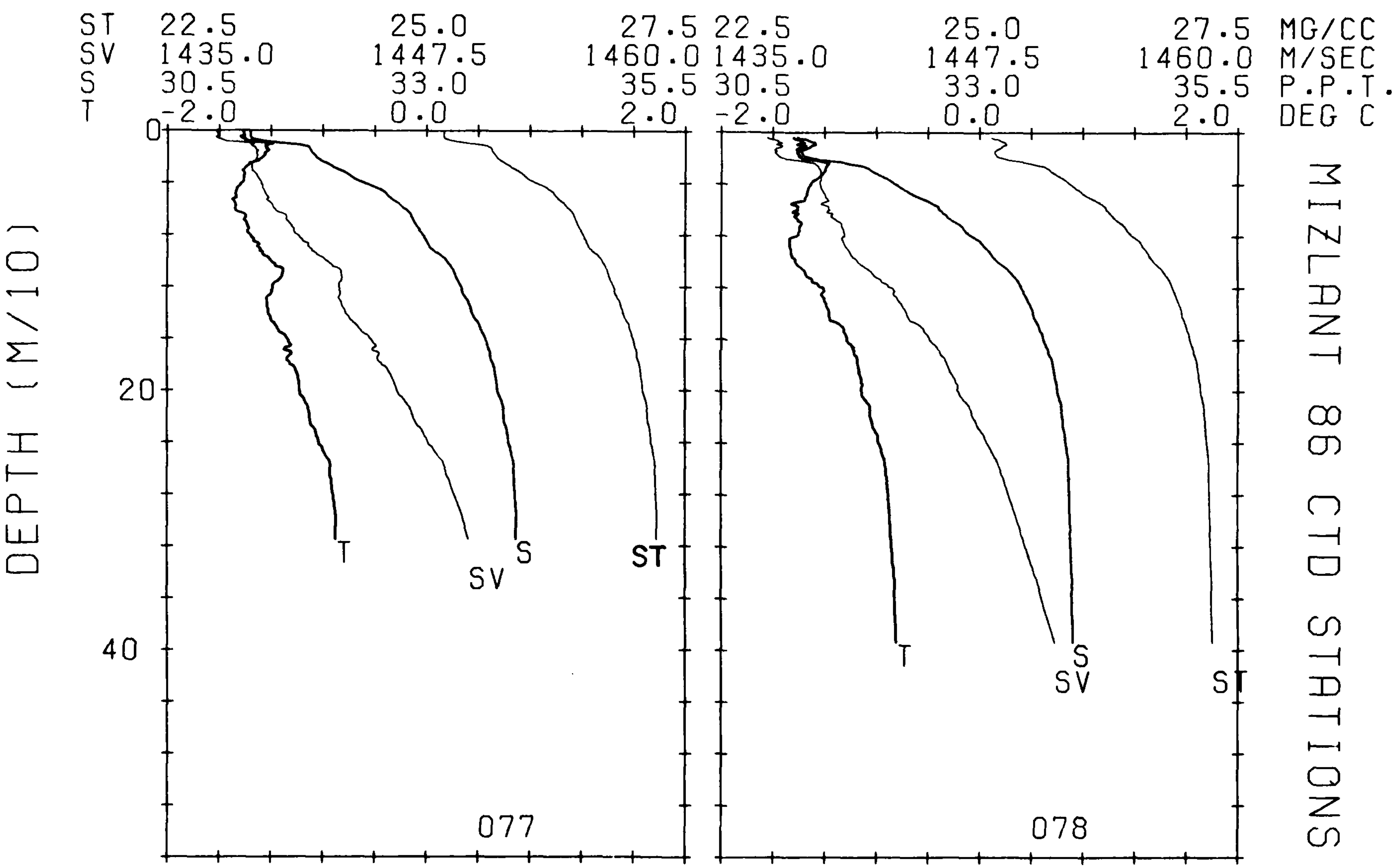
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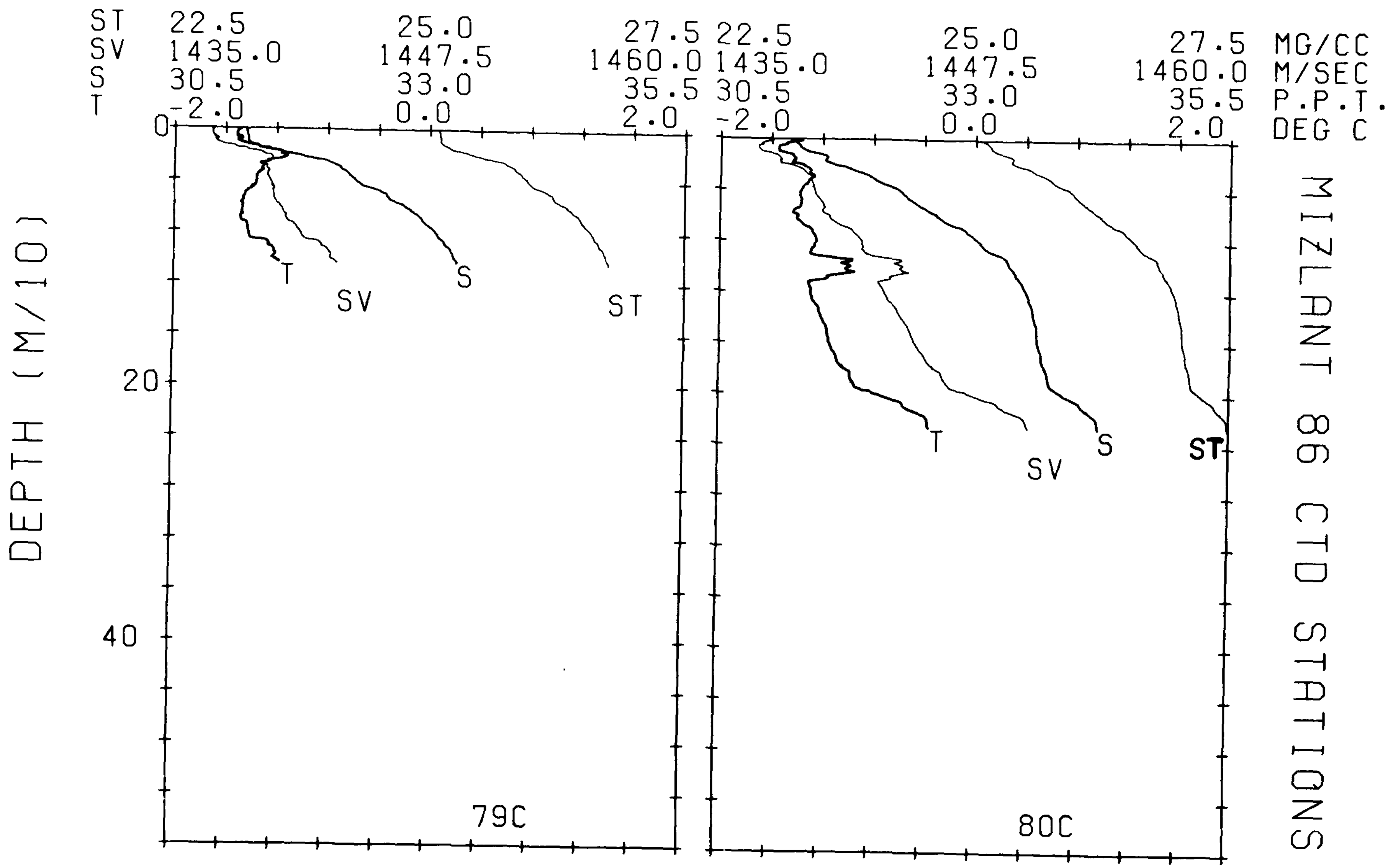

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0.0
27.5
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2.0
MG/CC
M/SEC
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DEG C
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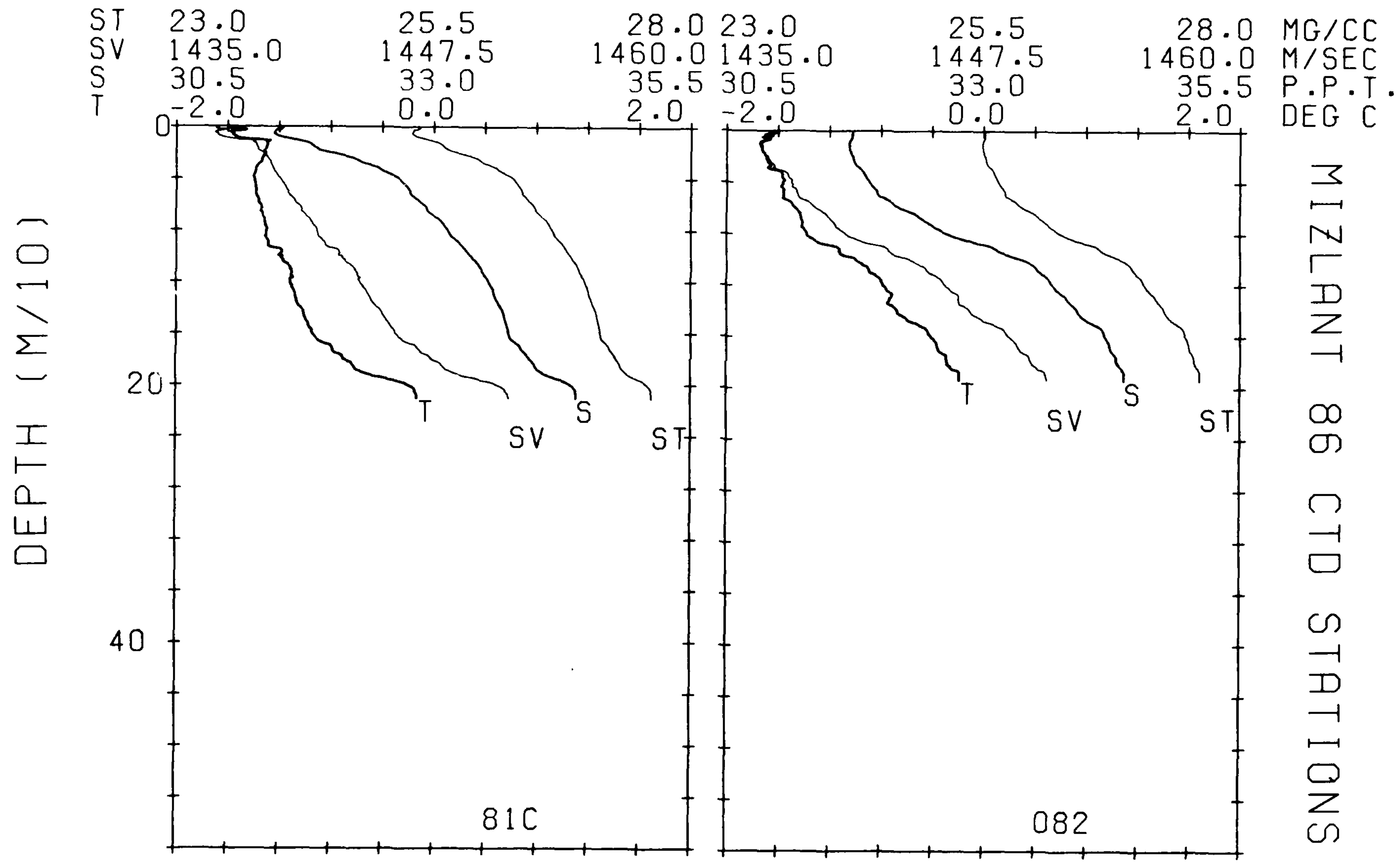

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DEPTH (M/10)
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SV
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33.0
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28.0
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M/SEC
P.P.T.
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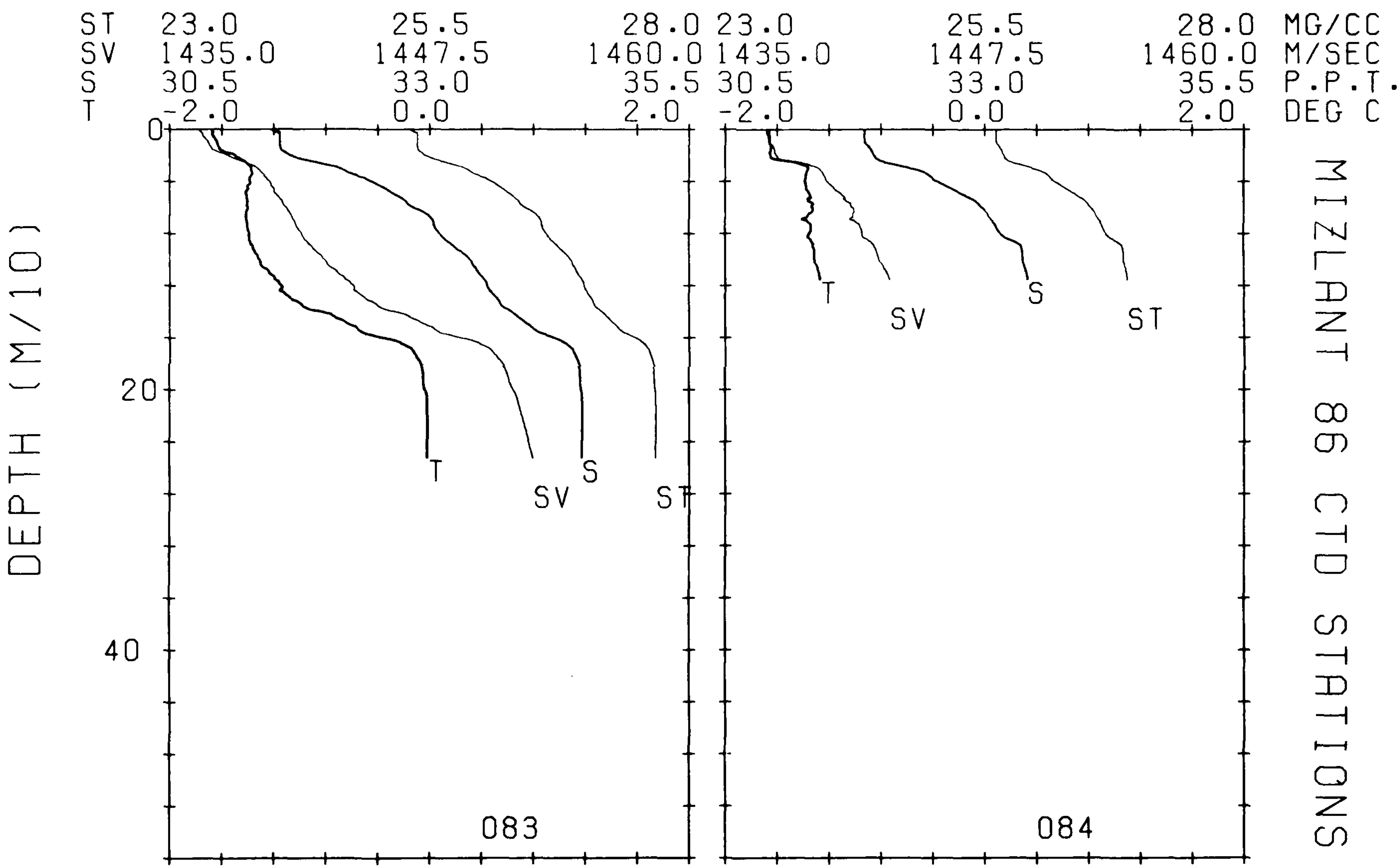
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S
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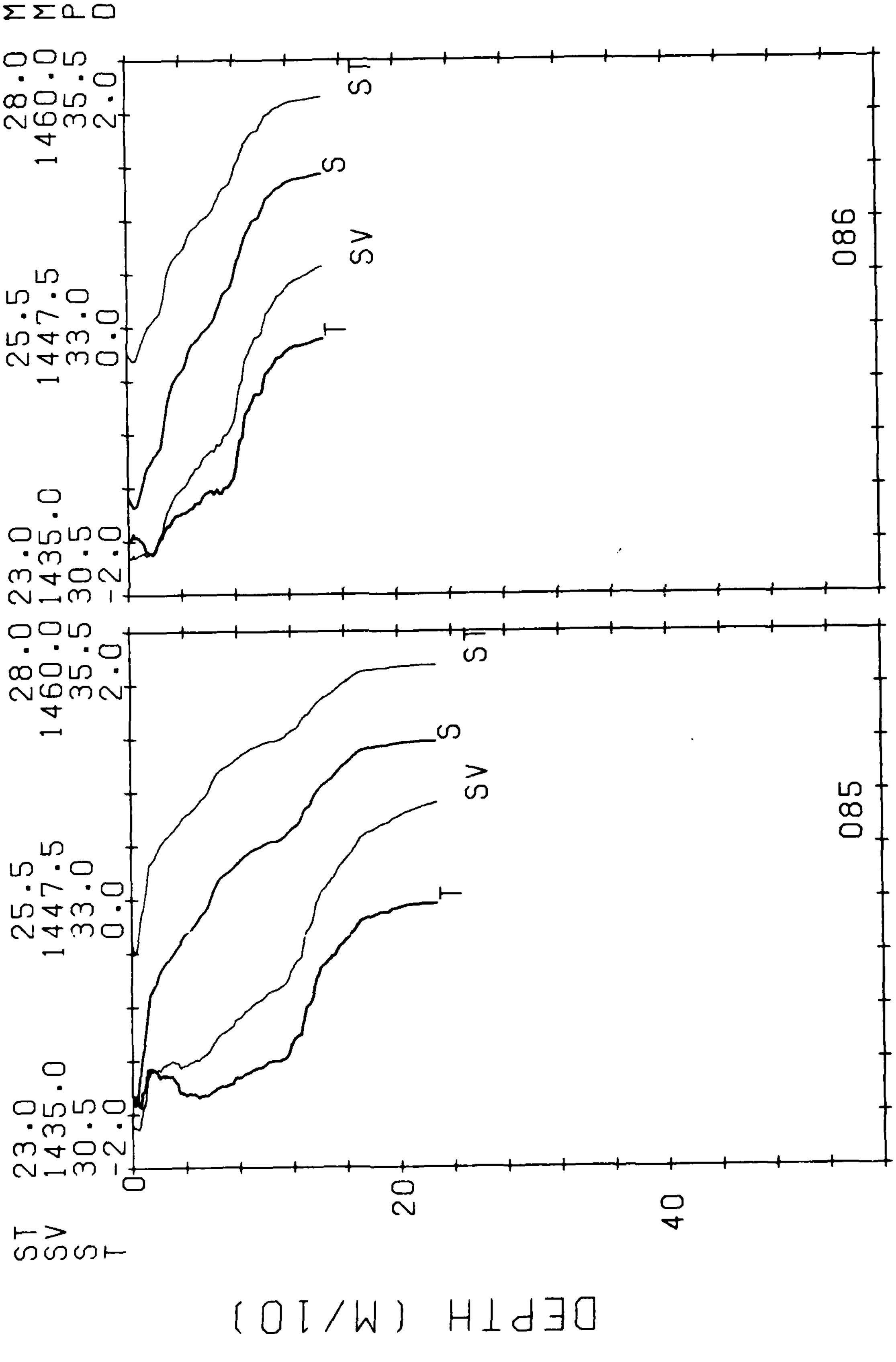
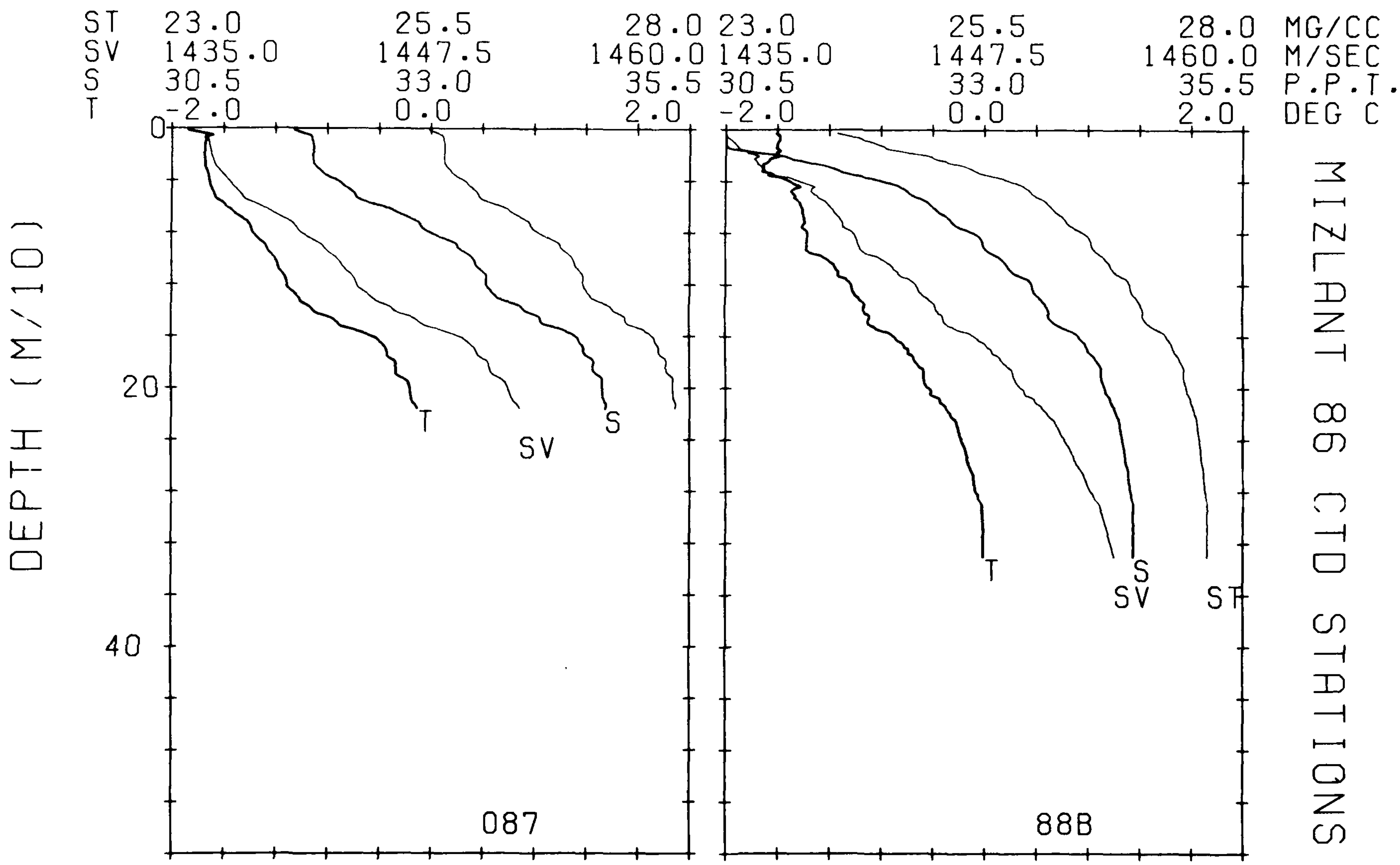
MIZLANT 86 CTD STATIONS





MIZLANT 86 CTD STATIONS
DEPTH (M/10)
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M/SEC
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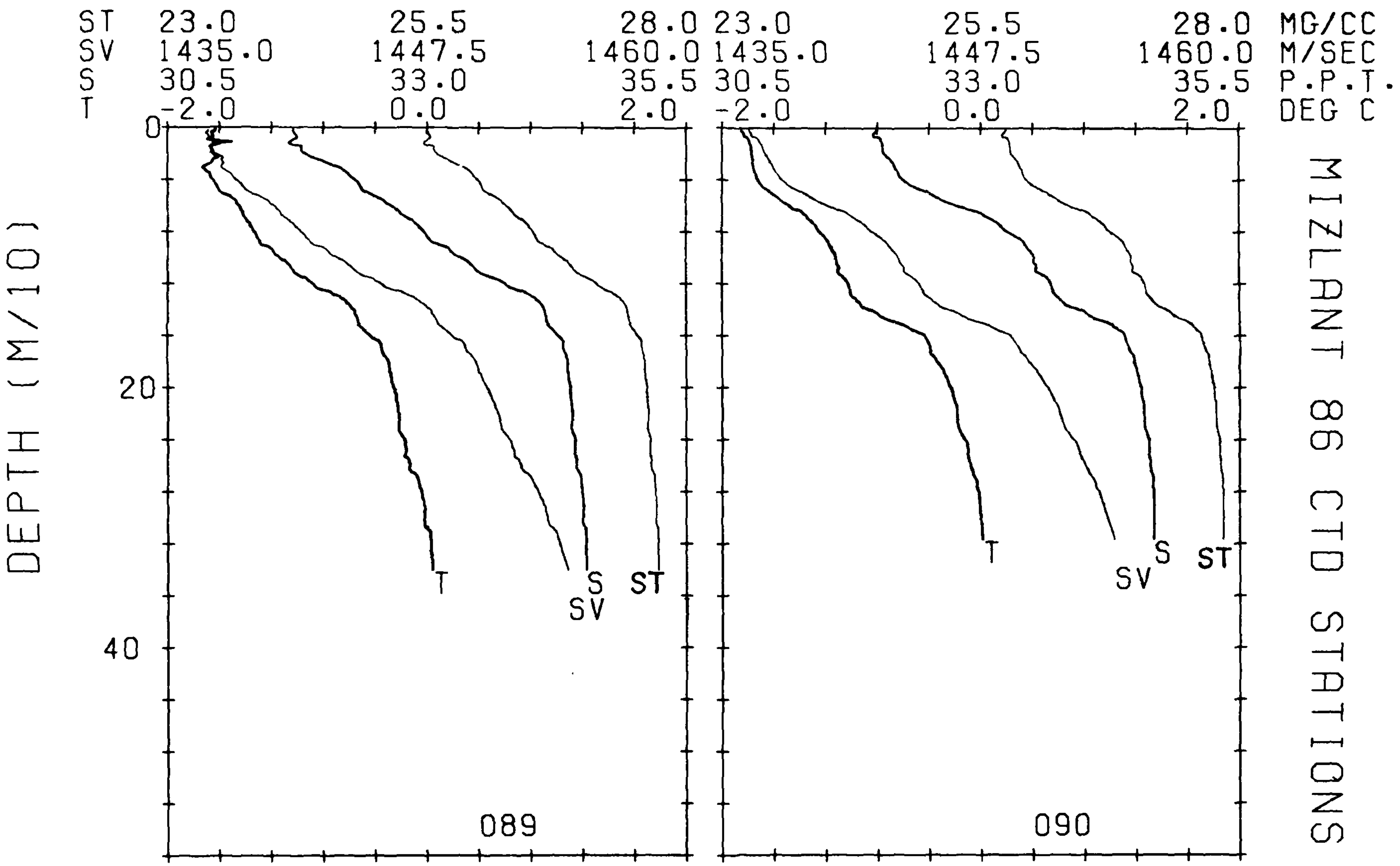

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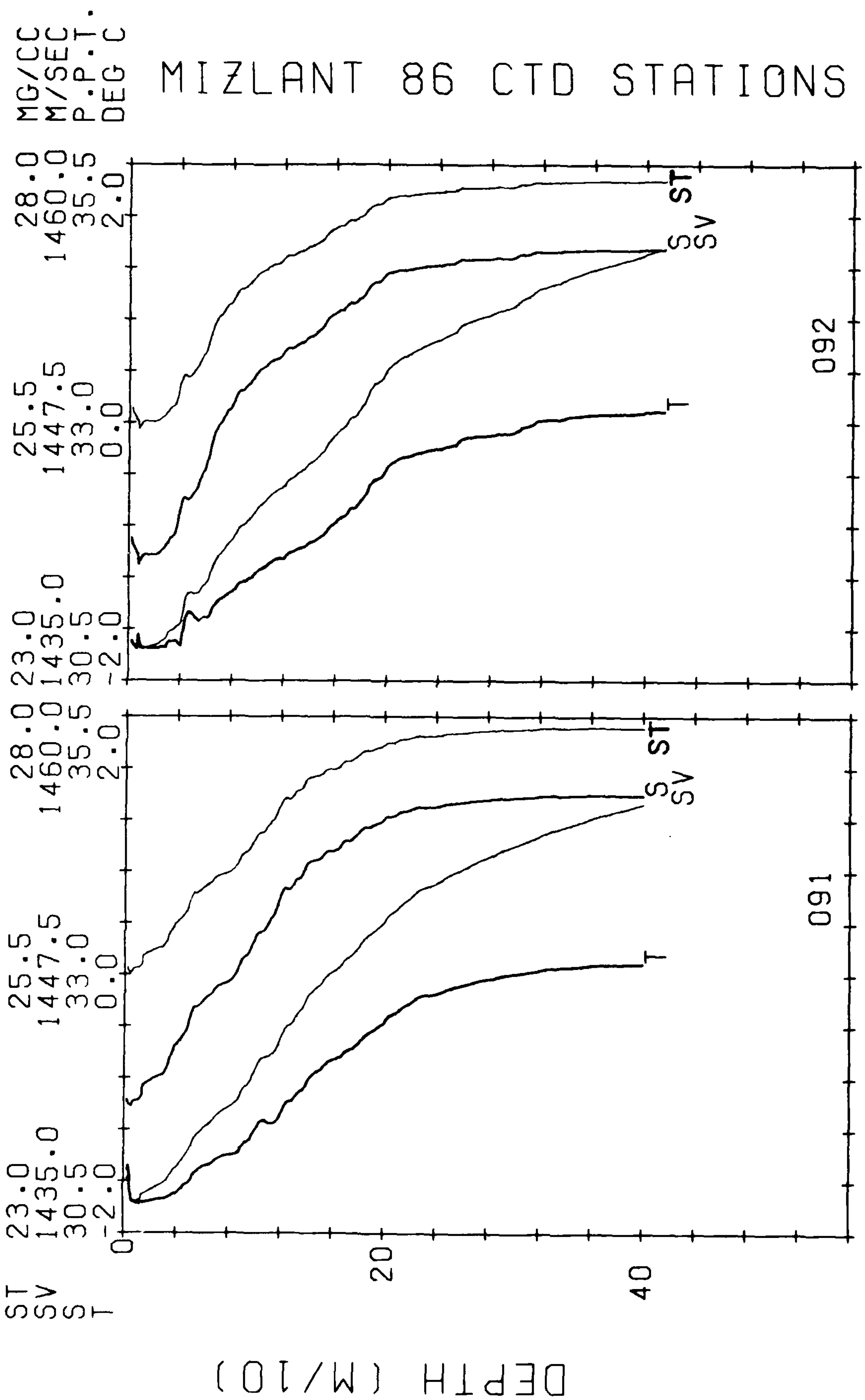

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M/SEC
P.P.T.
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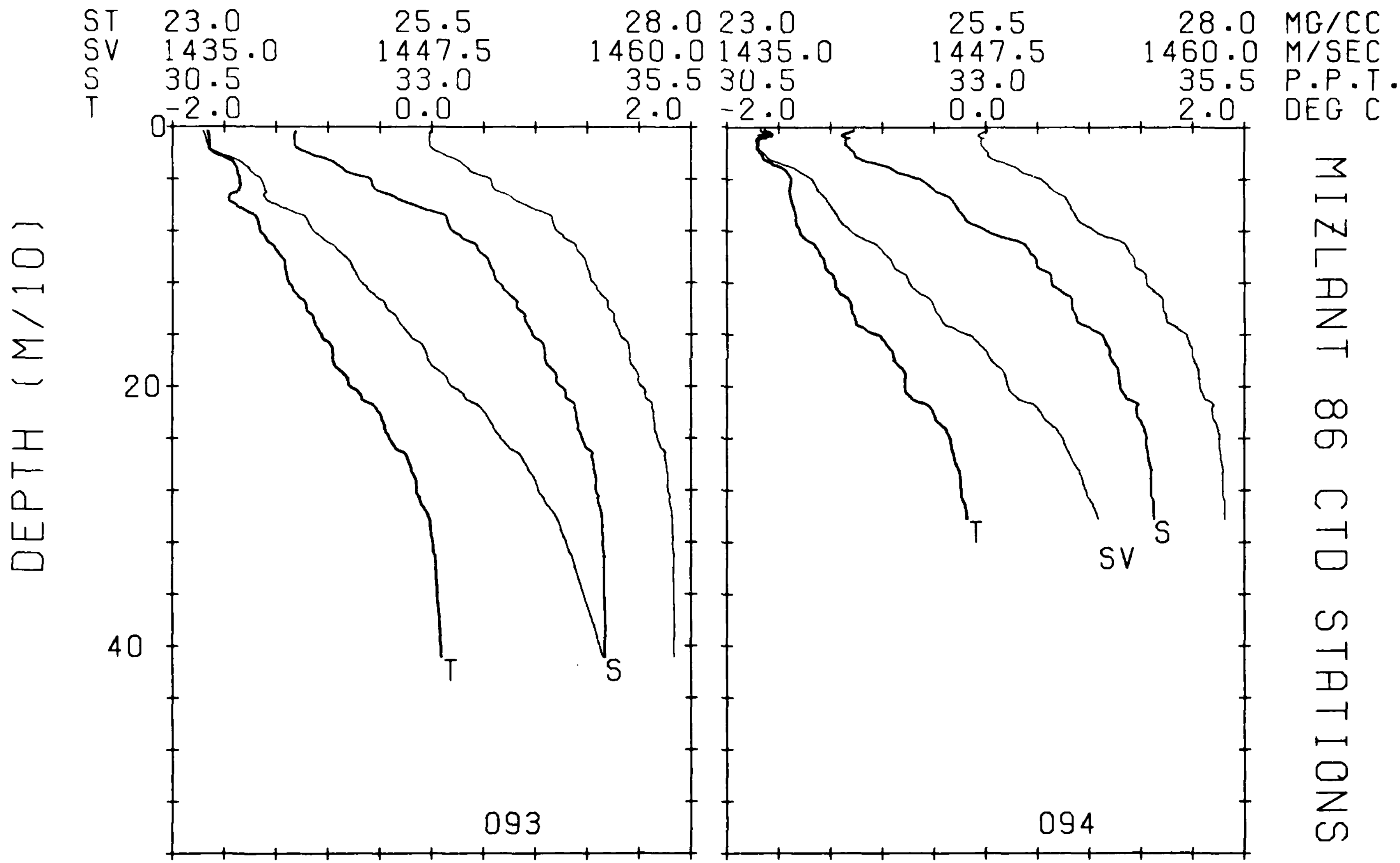
DEPTH (M/10)



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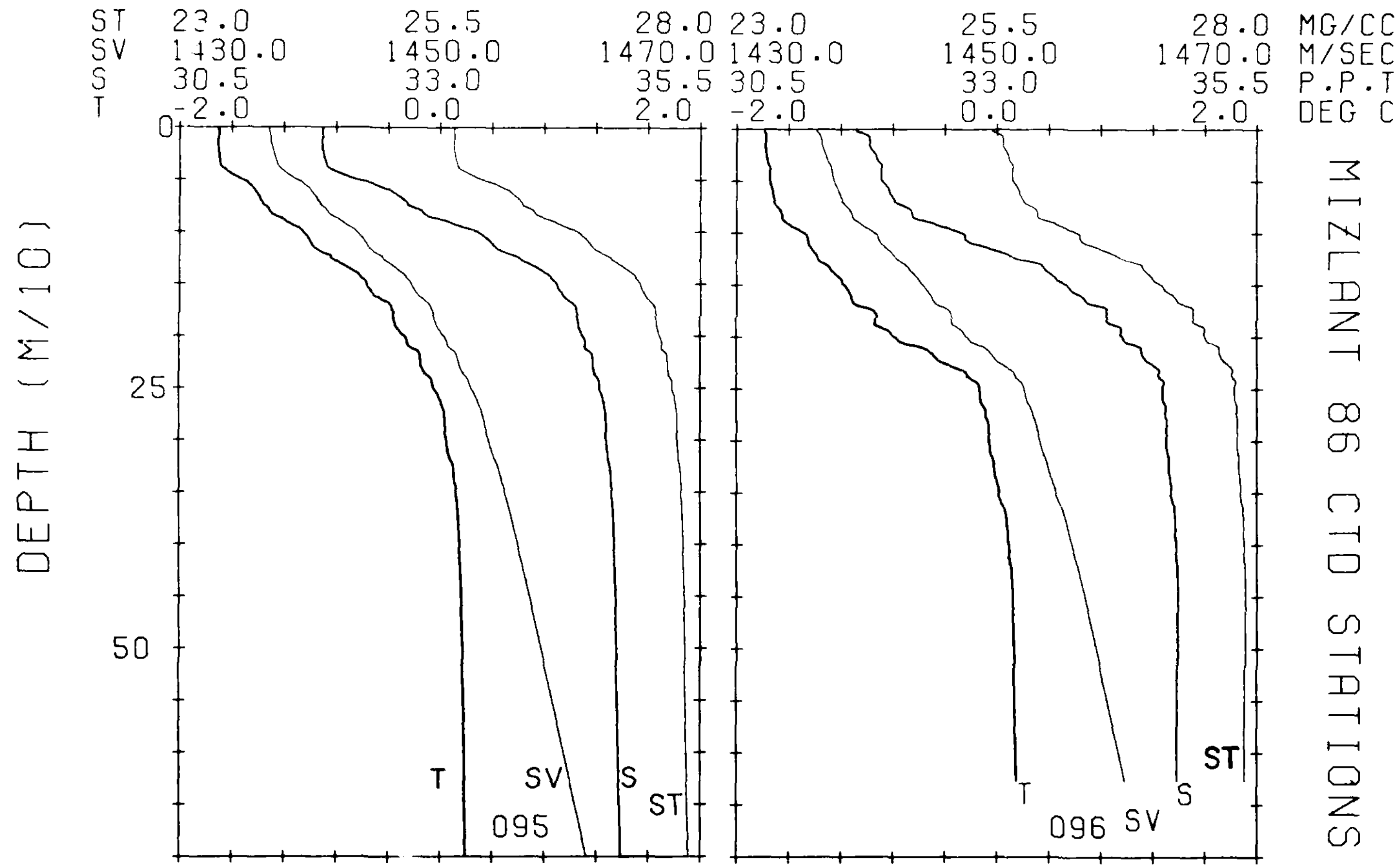
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T SV S ST
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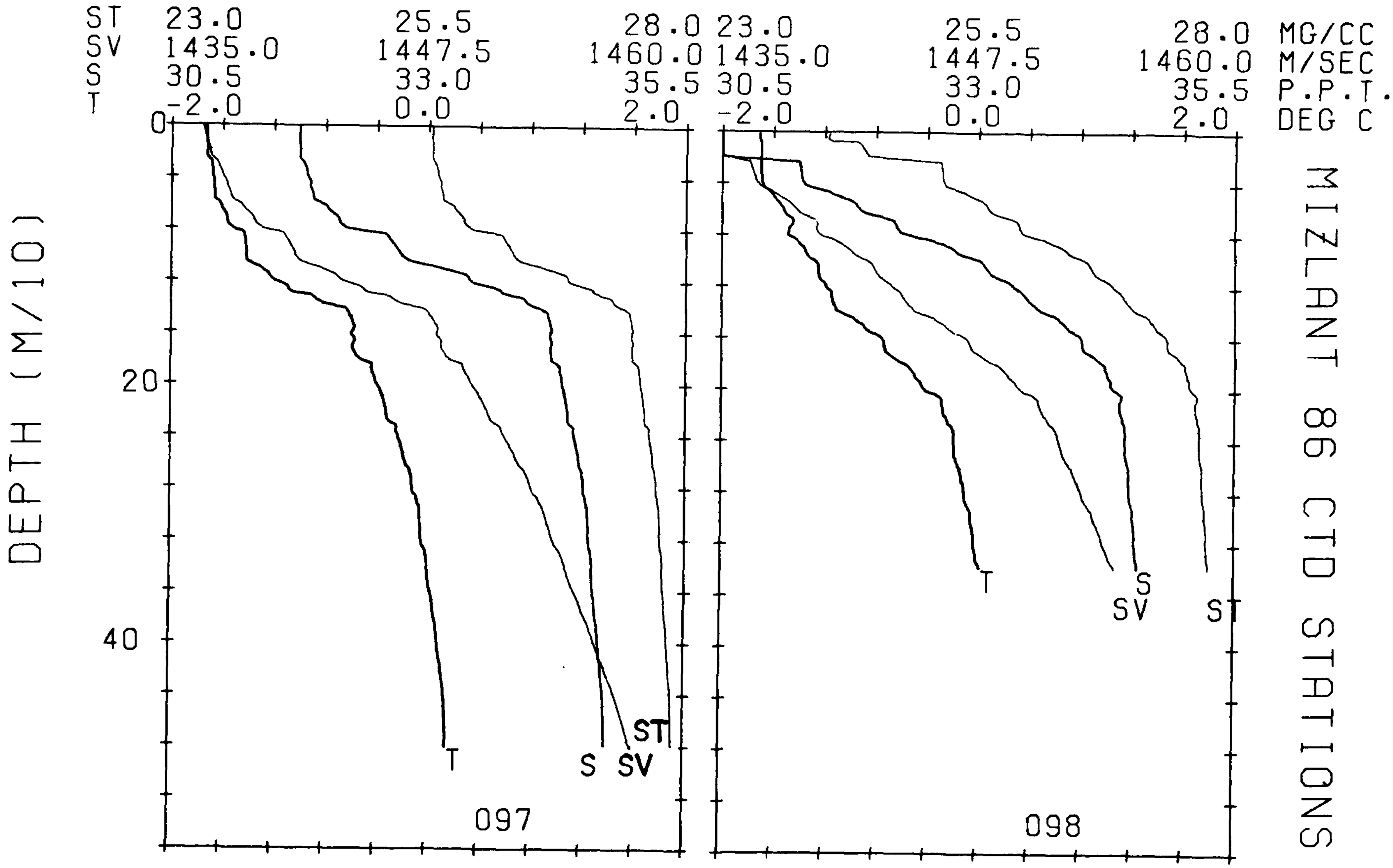

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DEPTH (M/10)
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S 30.5 33.0 35.5
T -2.0 0.0 2.0
MG/CC
M/SEC
P.P.T.
DEG C
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T
S
SV
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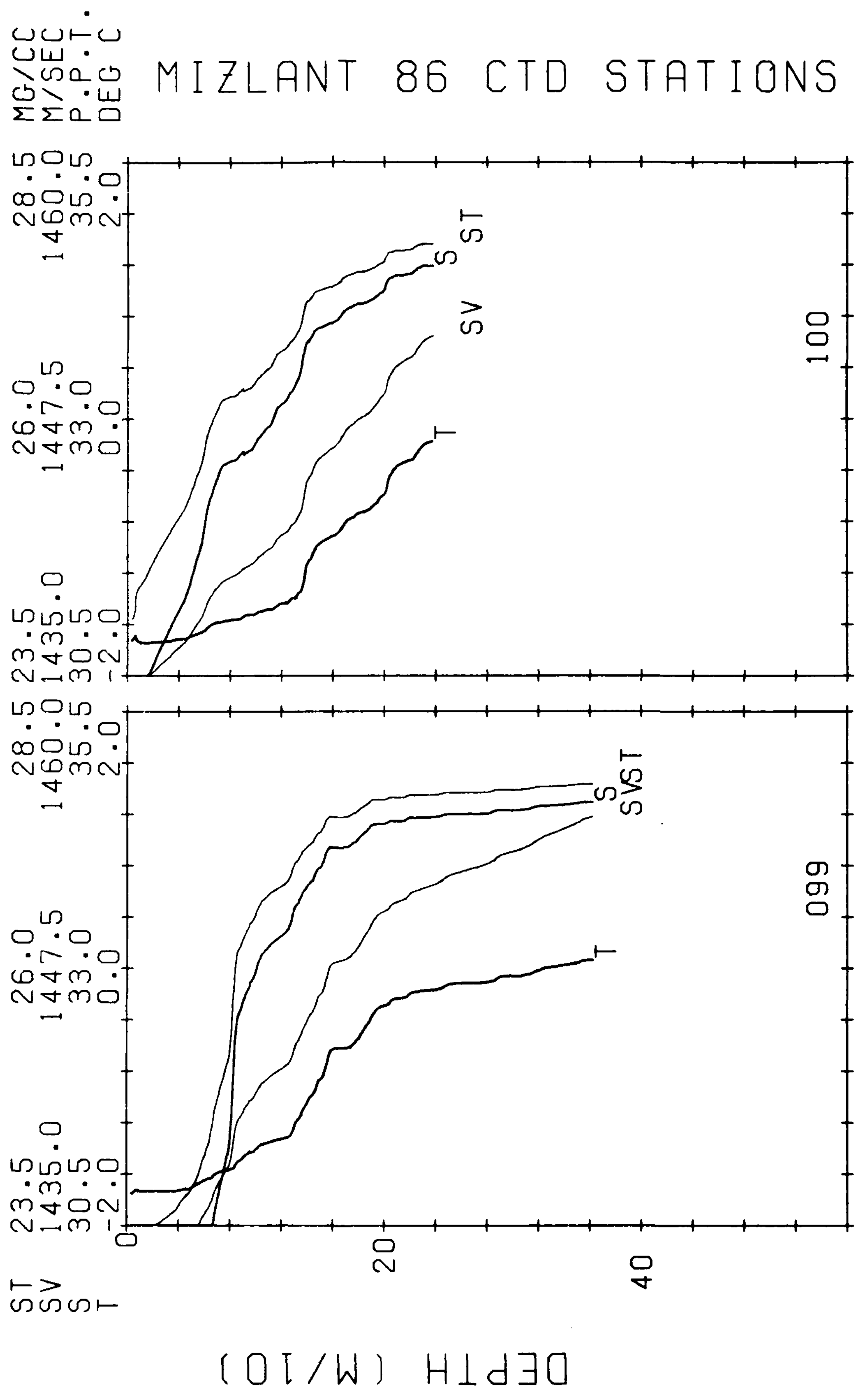

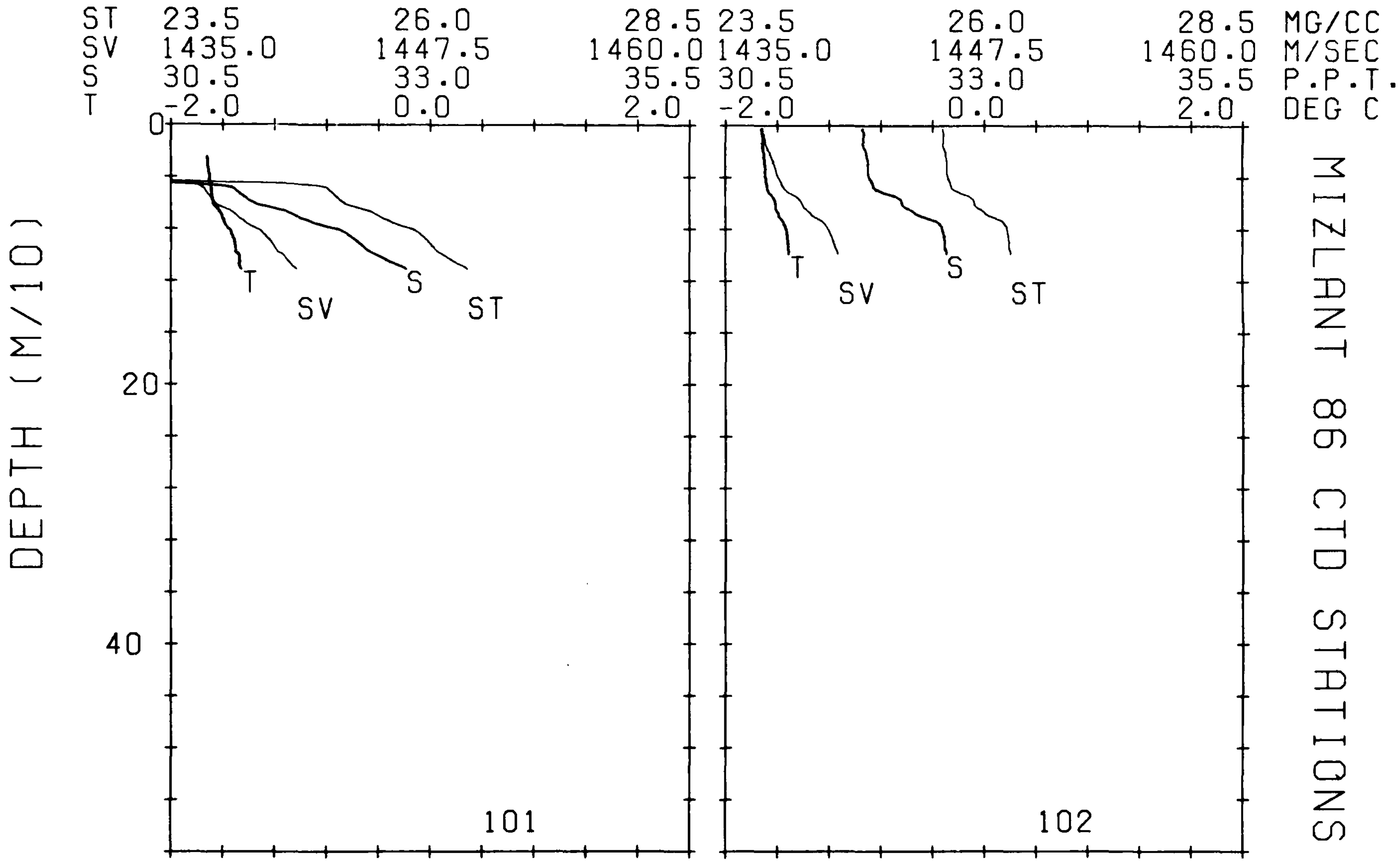
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DEPTH (M/10)
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S
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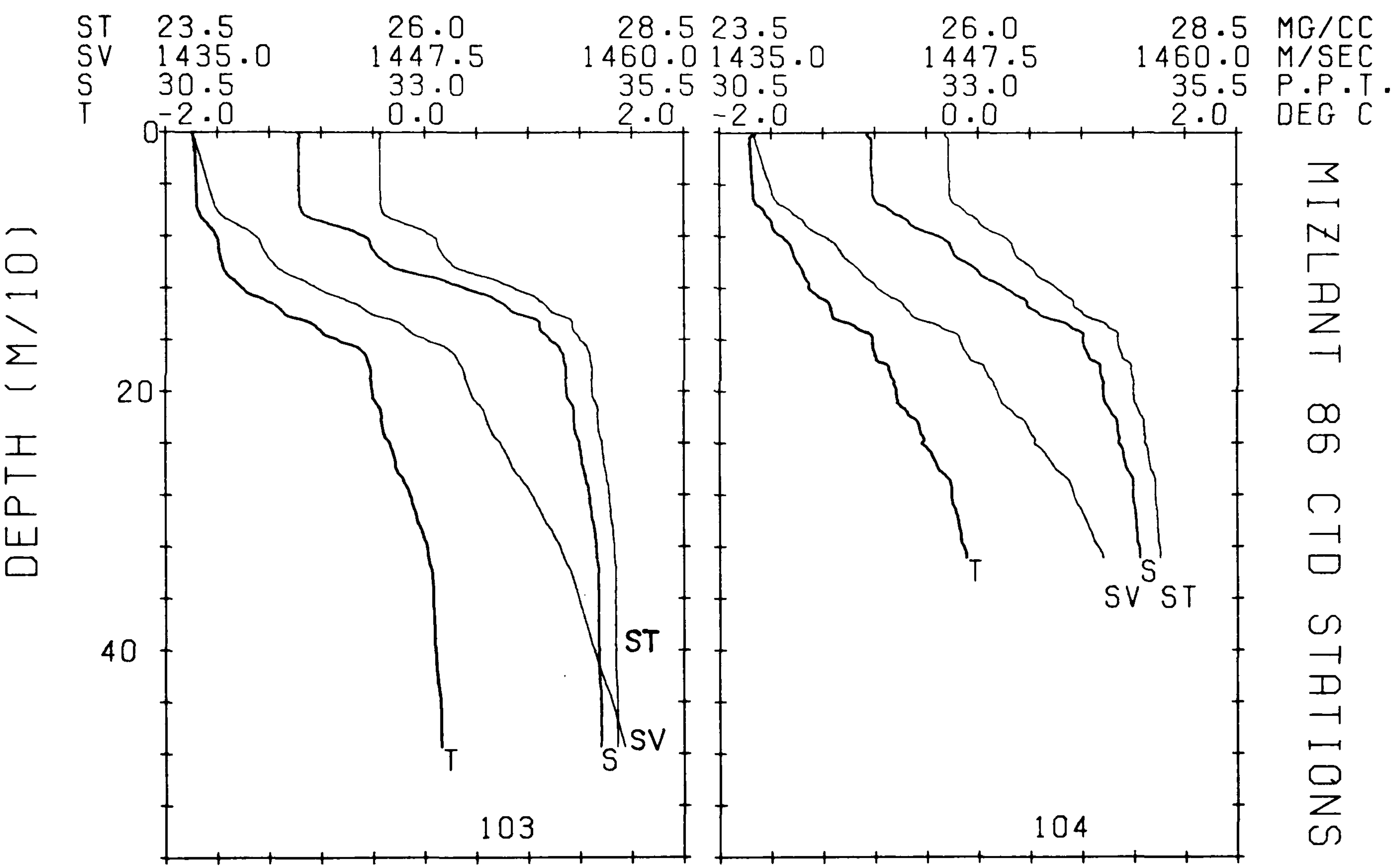
MIZLANT 86 CTD STATIONS



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S 30.5 33.0 35.5 30.5 33.0 35.5 P.P.T.
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DEPTH (M/10)
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S
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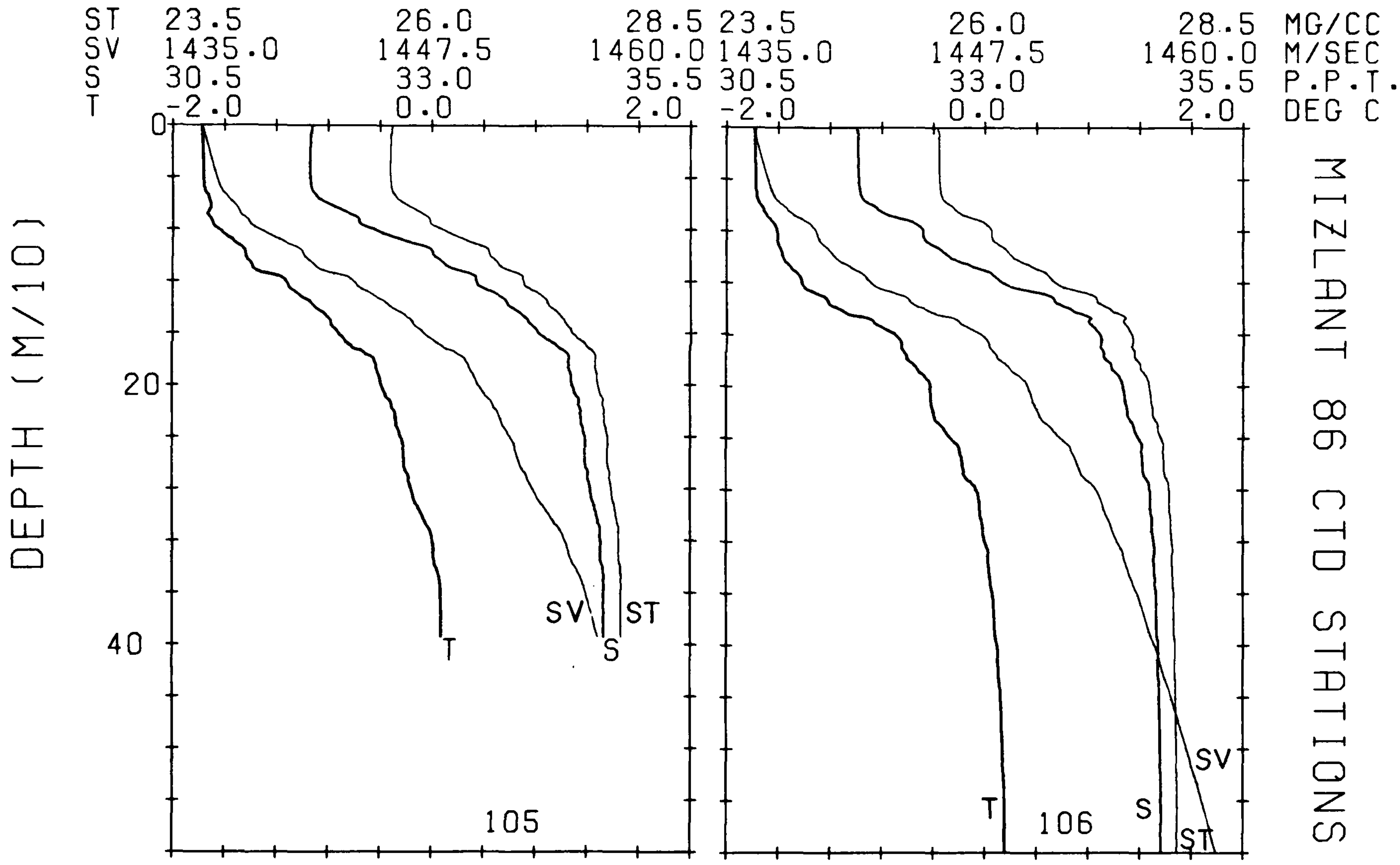
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S 30.5 33.0 35.5 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 -2.0 0.0 2.0 DEG C
DEPTH (M/10)
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ST
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SV
ST
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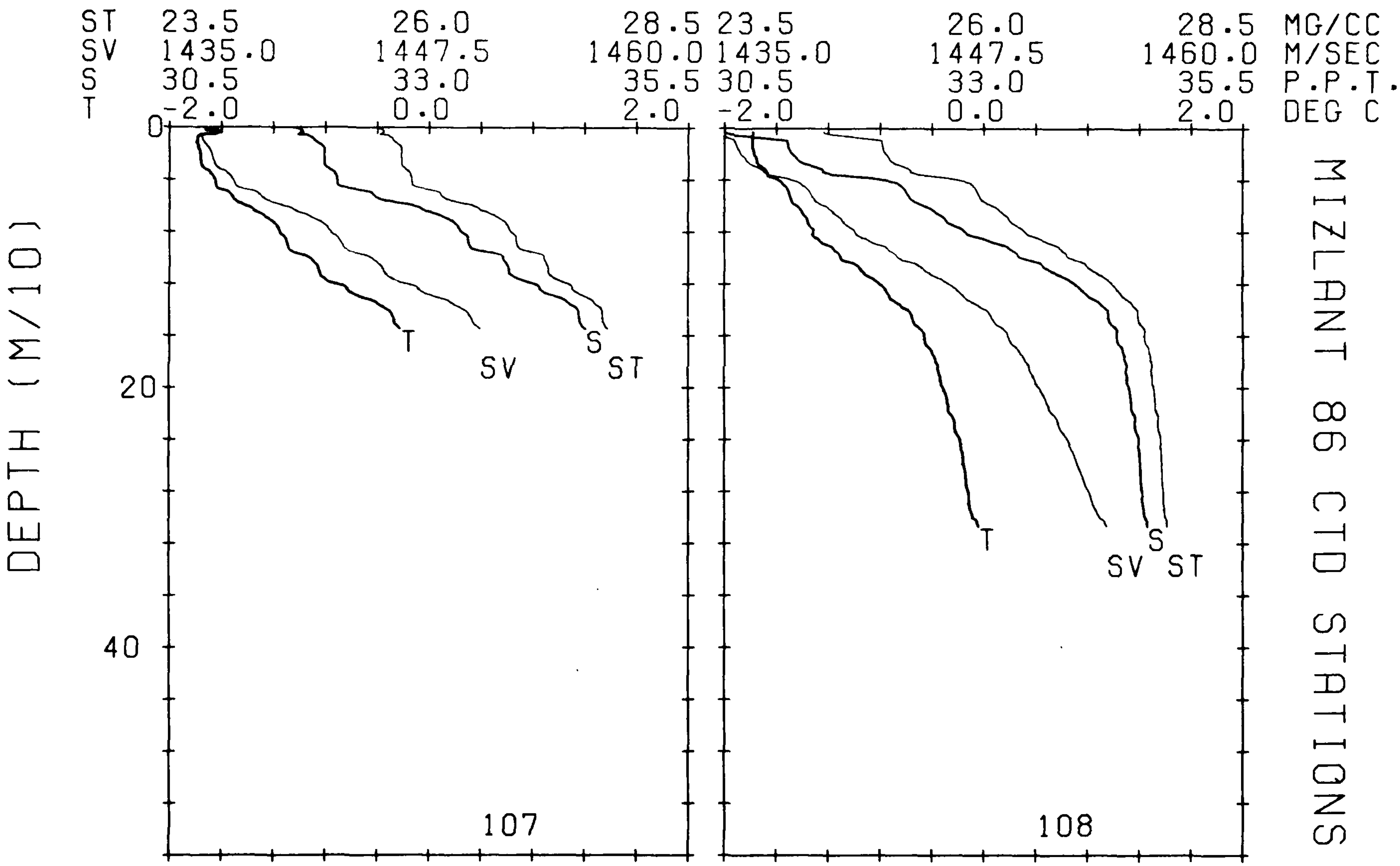

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S 30.5 33.0 35.5 P.P.T.
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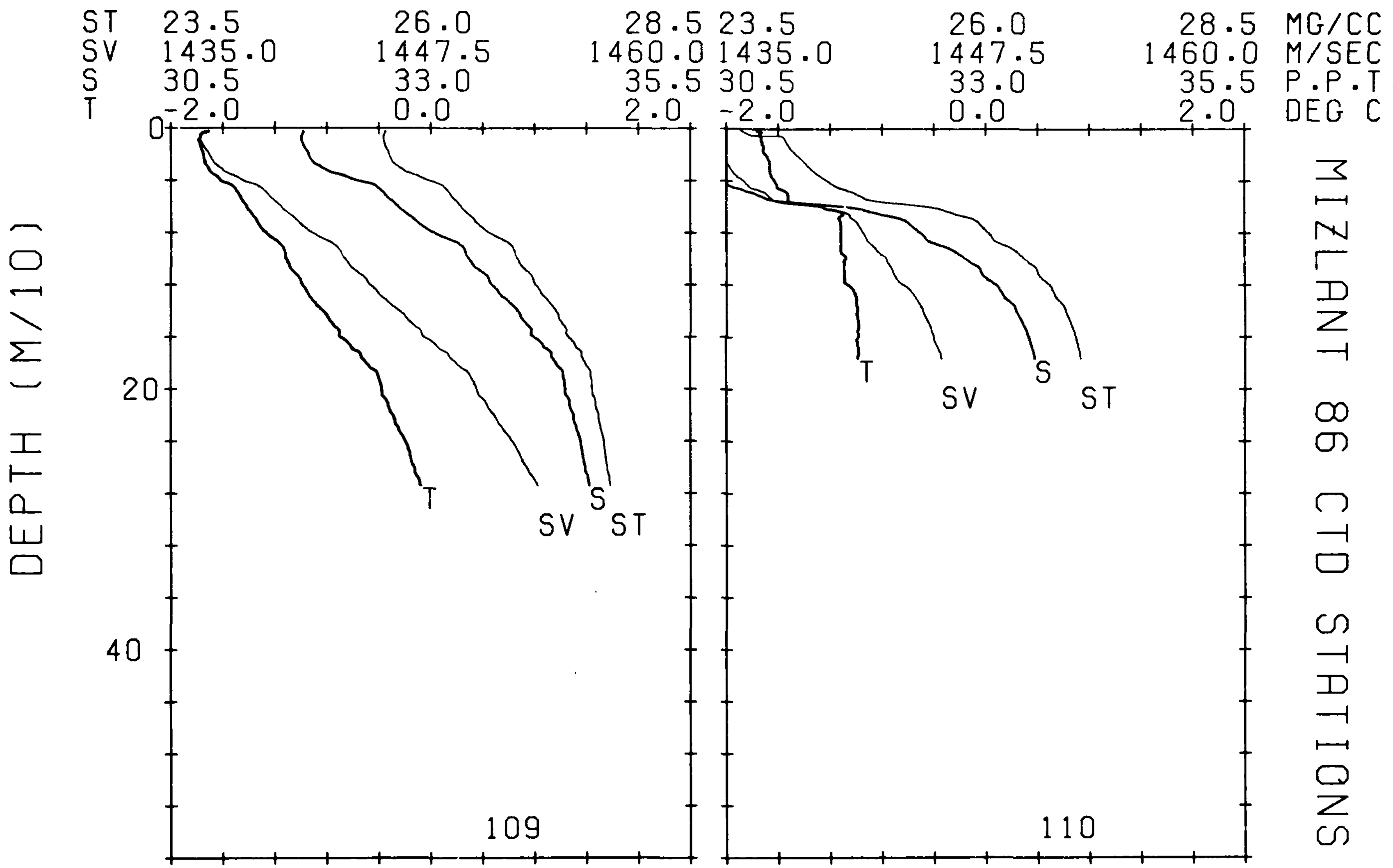

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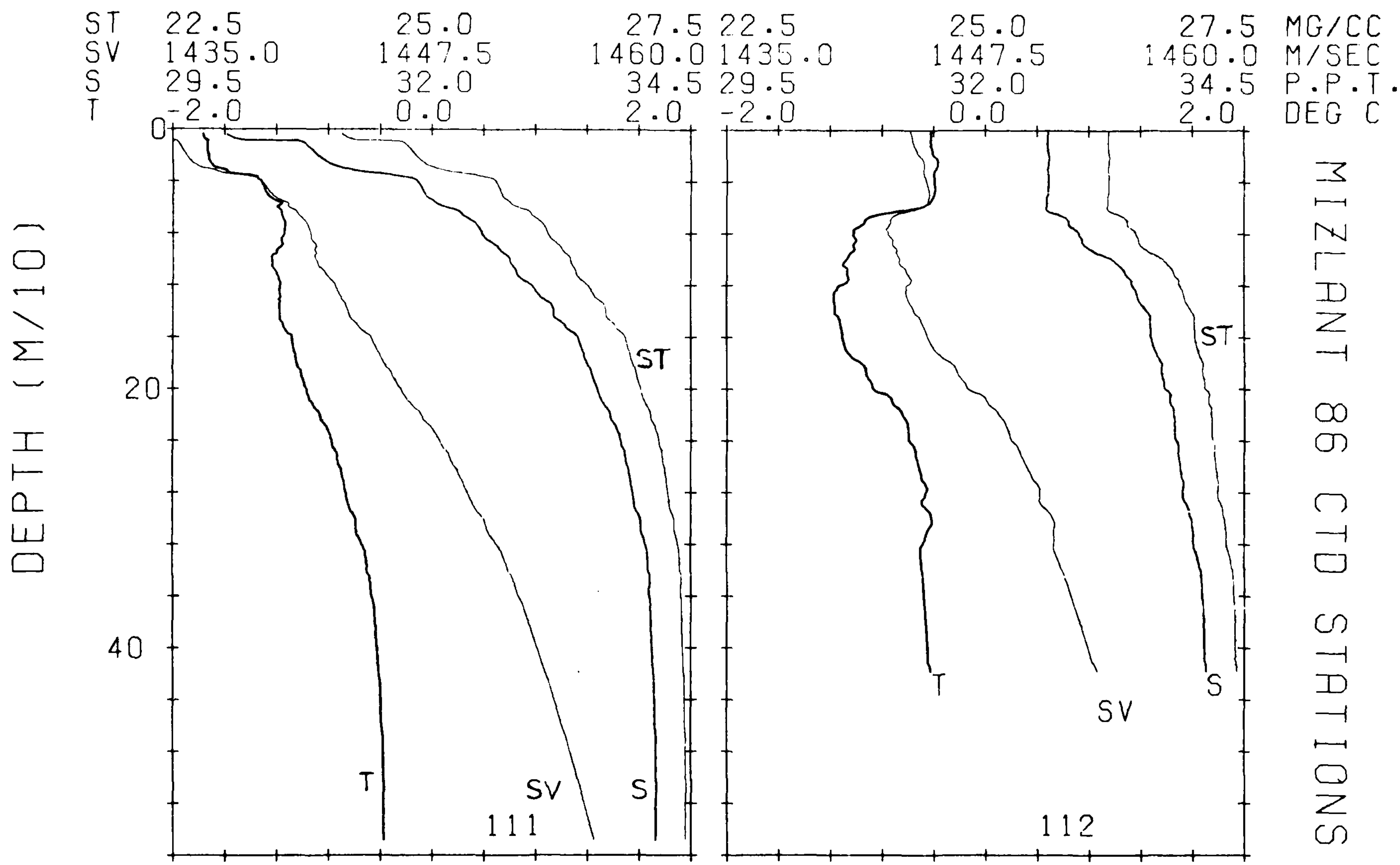
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SV 1435.0 1447.5 1460.0 1435.0 1447.5 1460.0 M/SEC
S 29.5 32.0 34.5 29.5 32.0 34.5 P.P.T.
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SV
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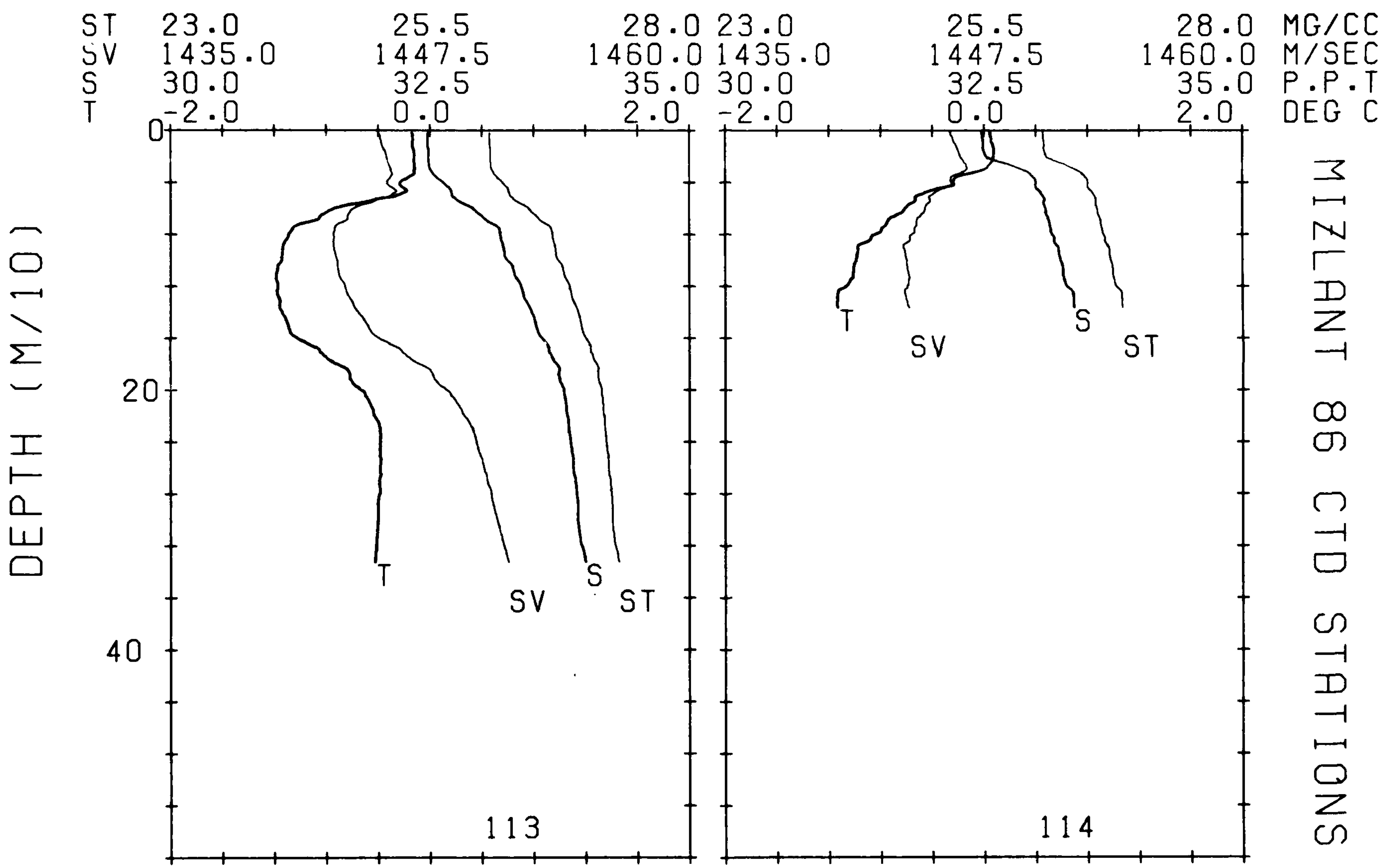
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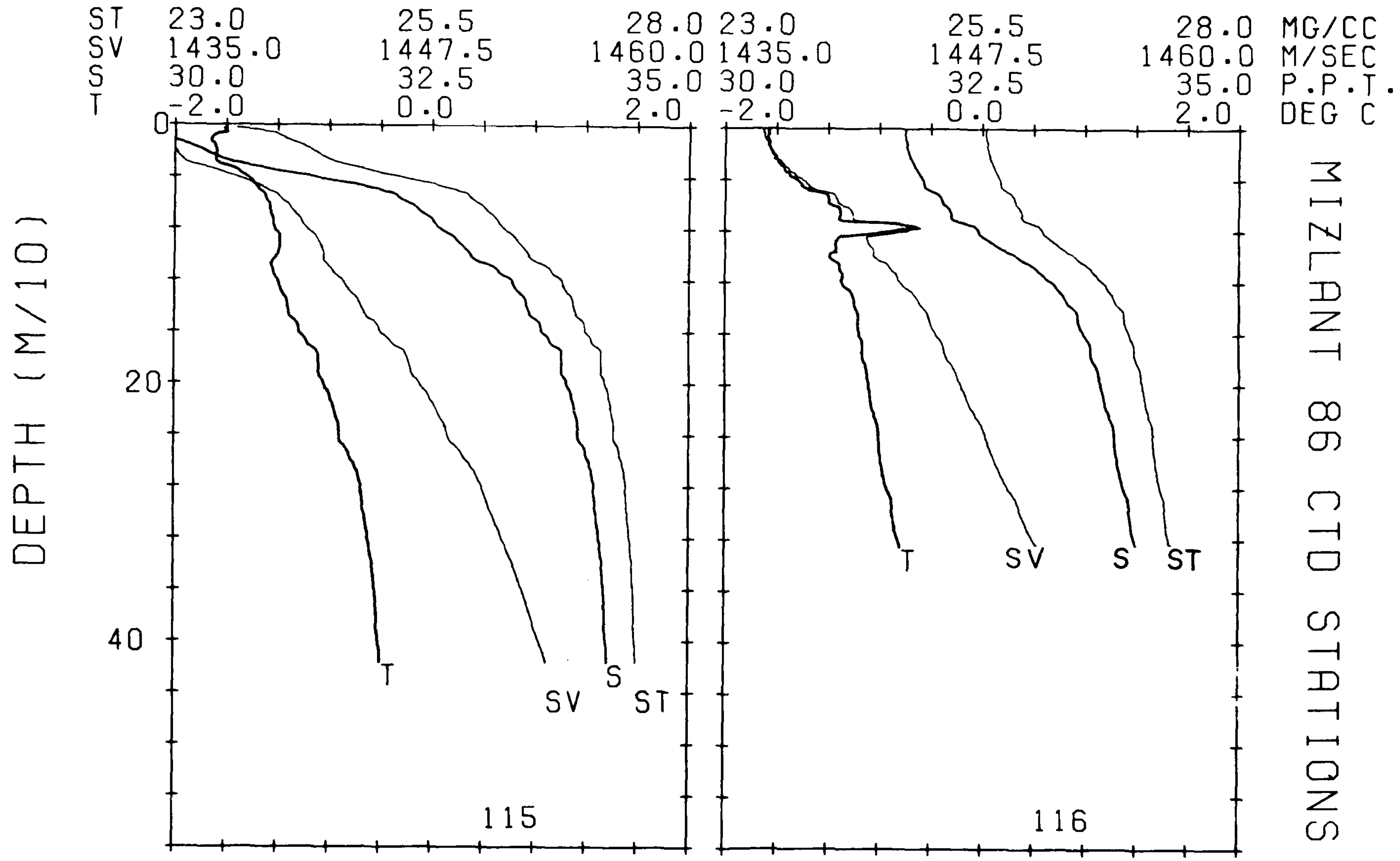

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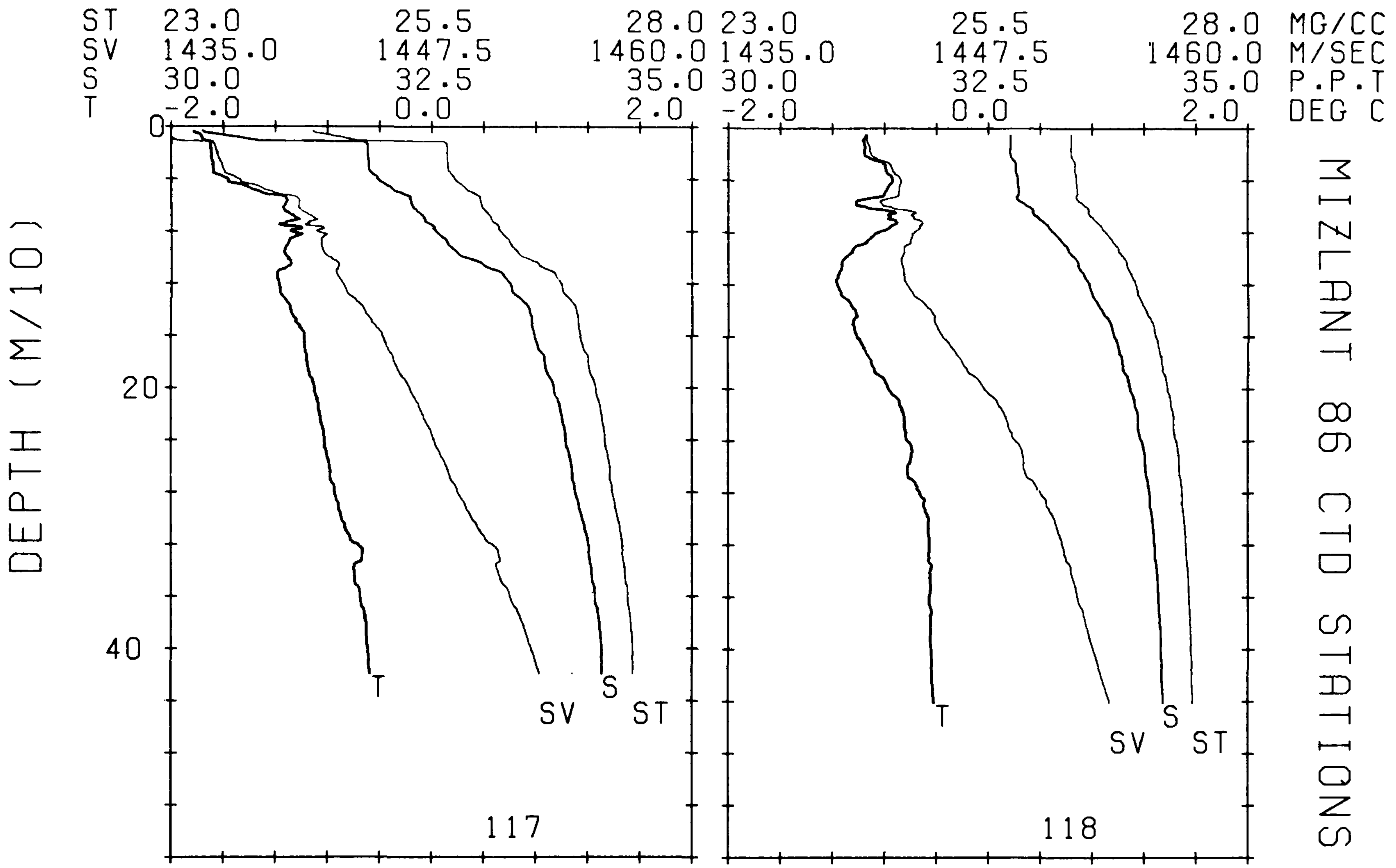
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M/SEC
P.P.T.
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SV
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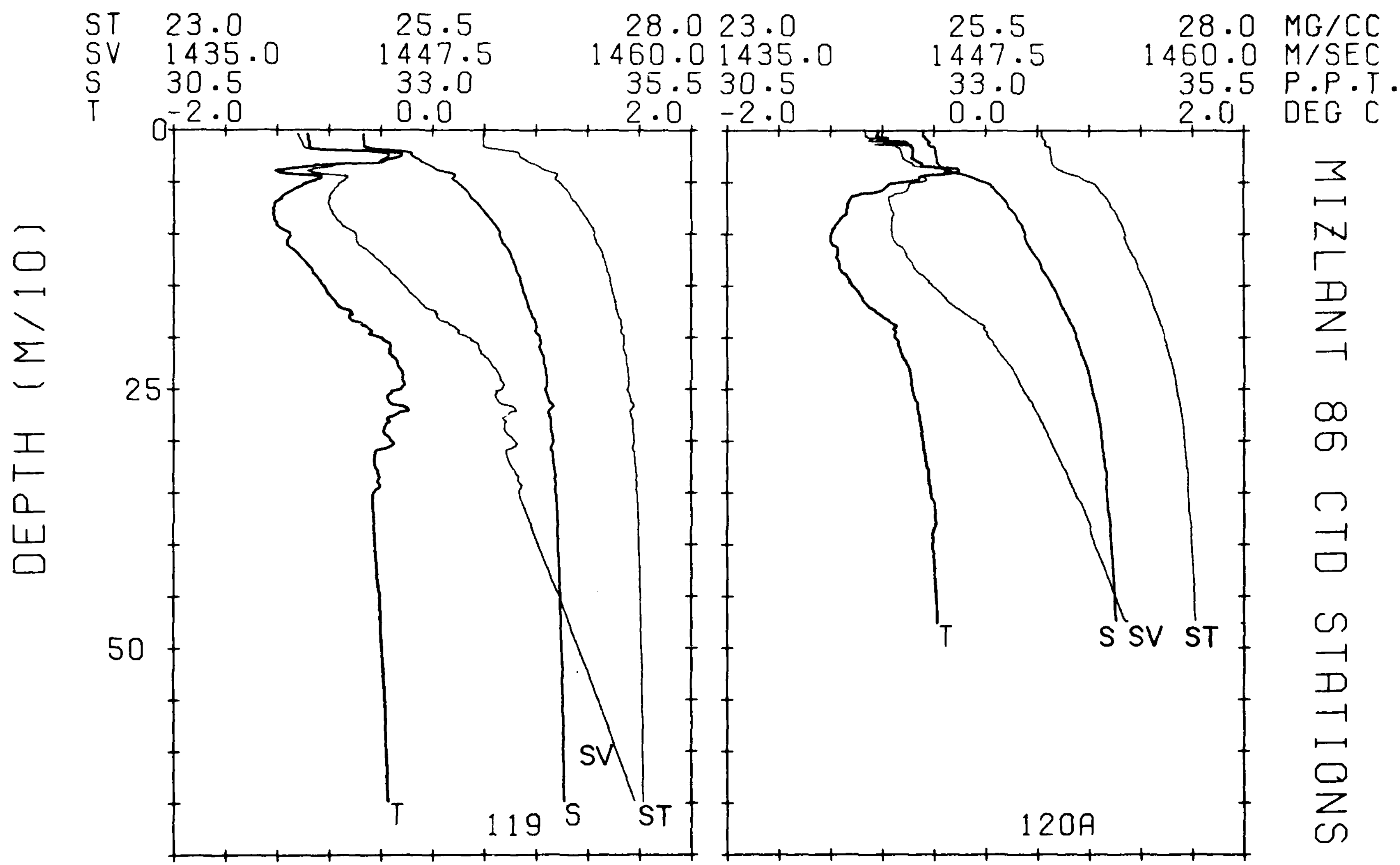

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SV 1435.0 1447.5 1460.0 1435.0 1447.5 1460.0 M/SEC
S 30.5 33.0 35.5 30.5 33.0 35.5 P.P.T.
T -2.0 0.0 2.0 -2.0 0.0 2.0 DEG C
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25
50
T
S
SV
ST
119
120A

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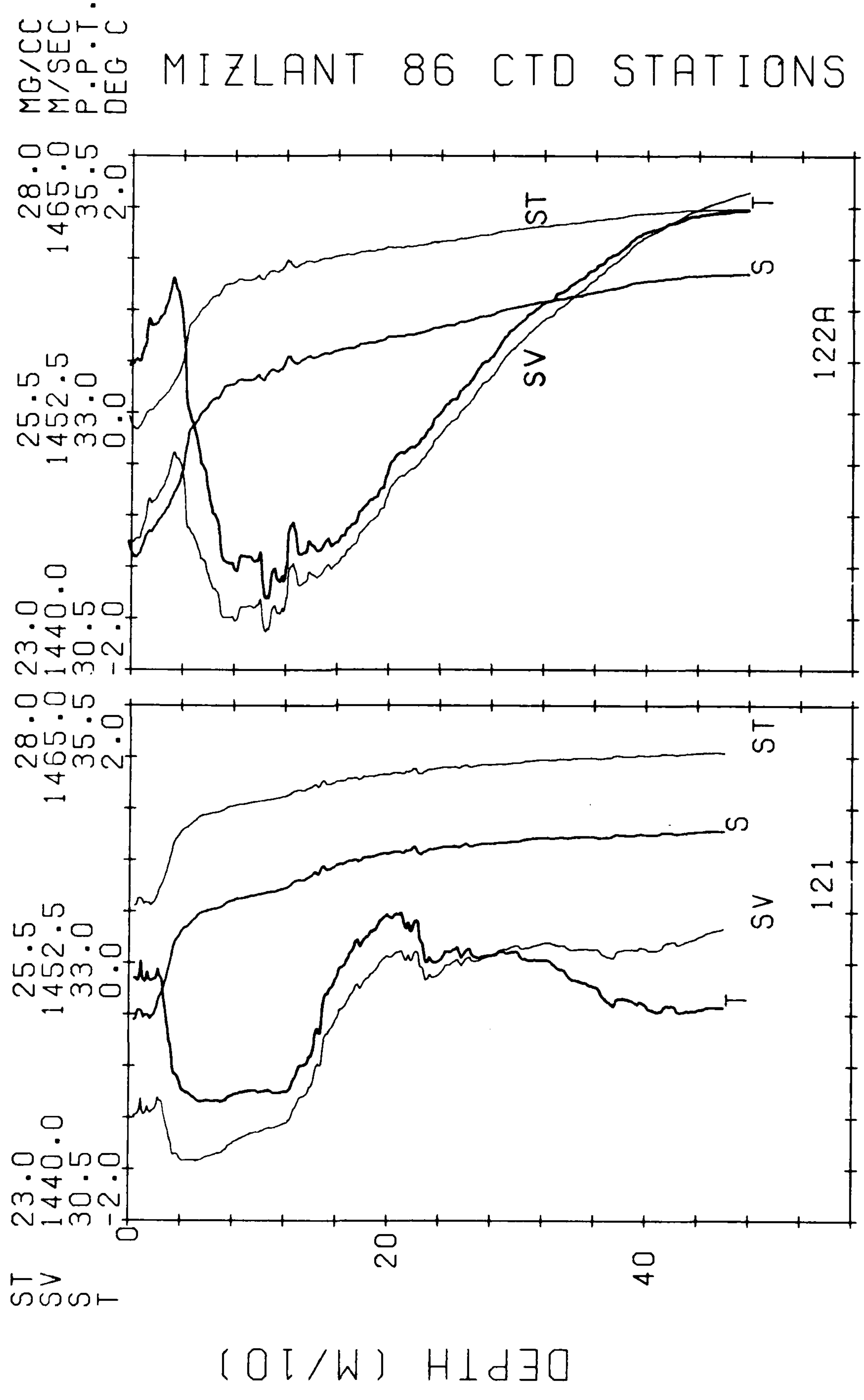

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MONTEREY CA R H BOURKE ET AL APR 88 NPS-68-84-004

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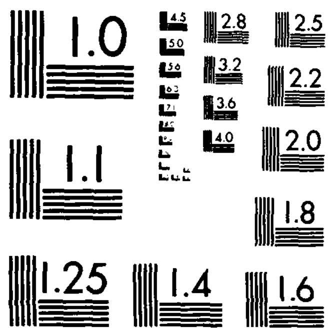
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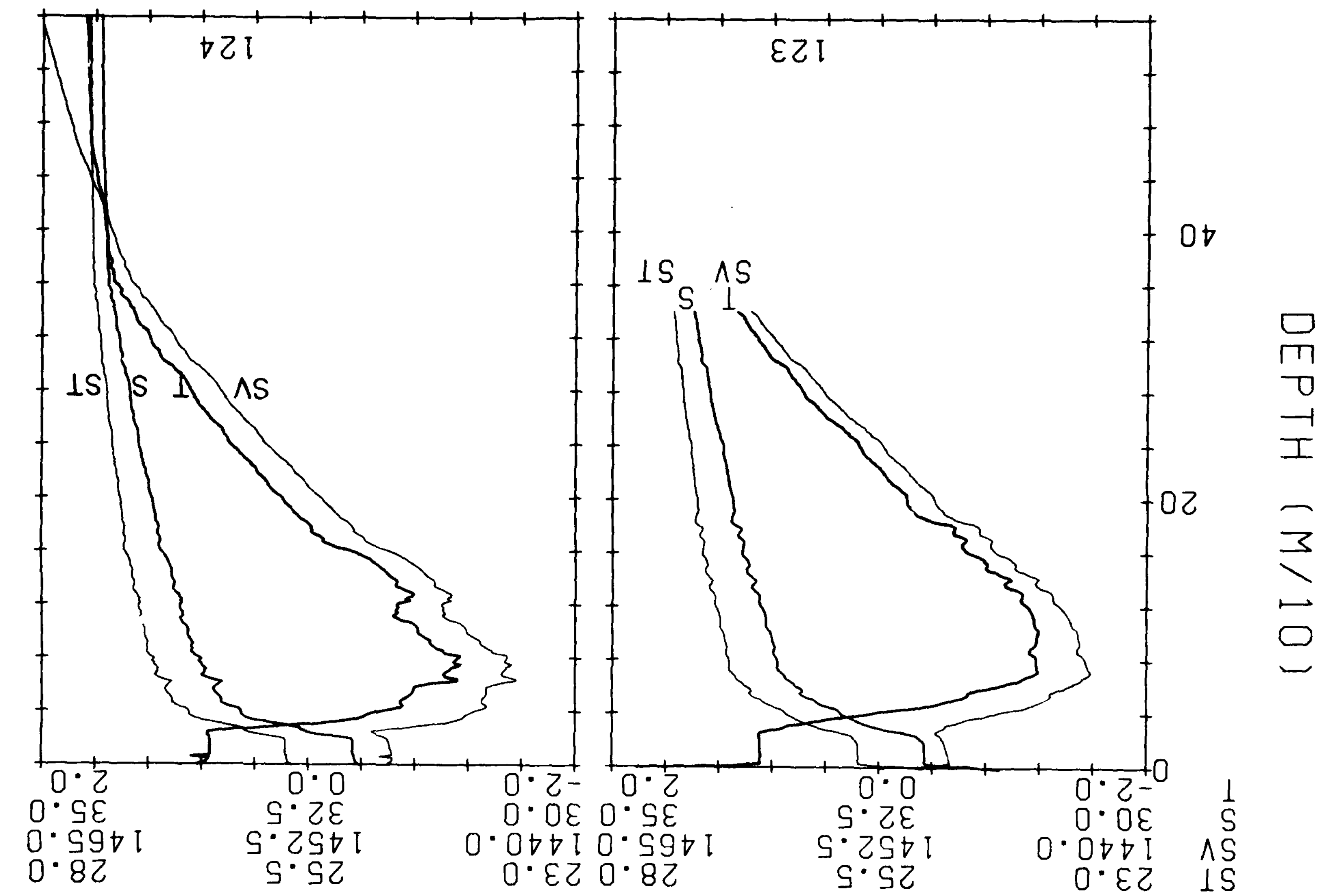
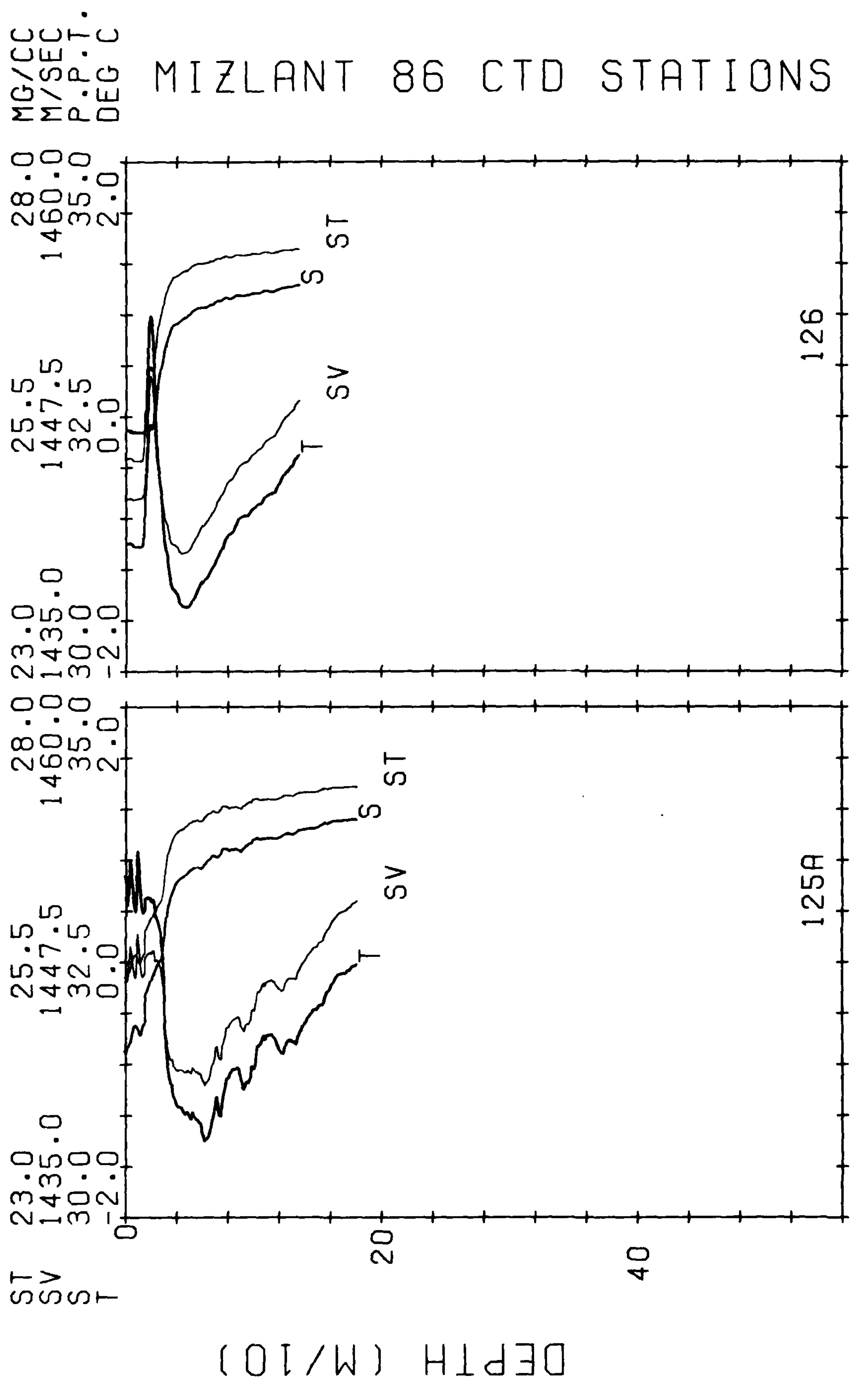
1.6

MIZLANT 86 CTD STATIONS





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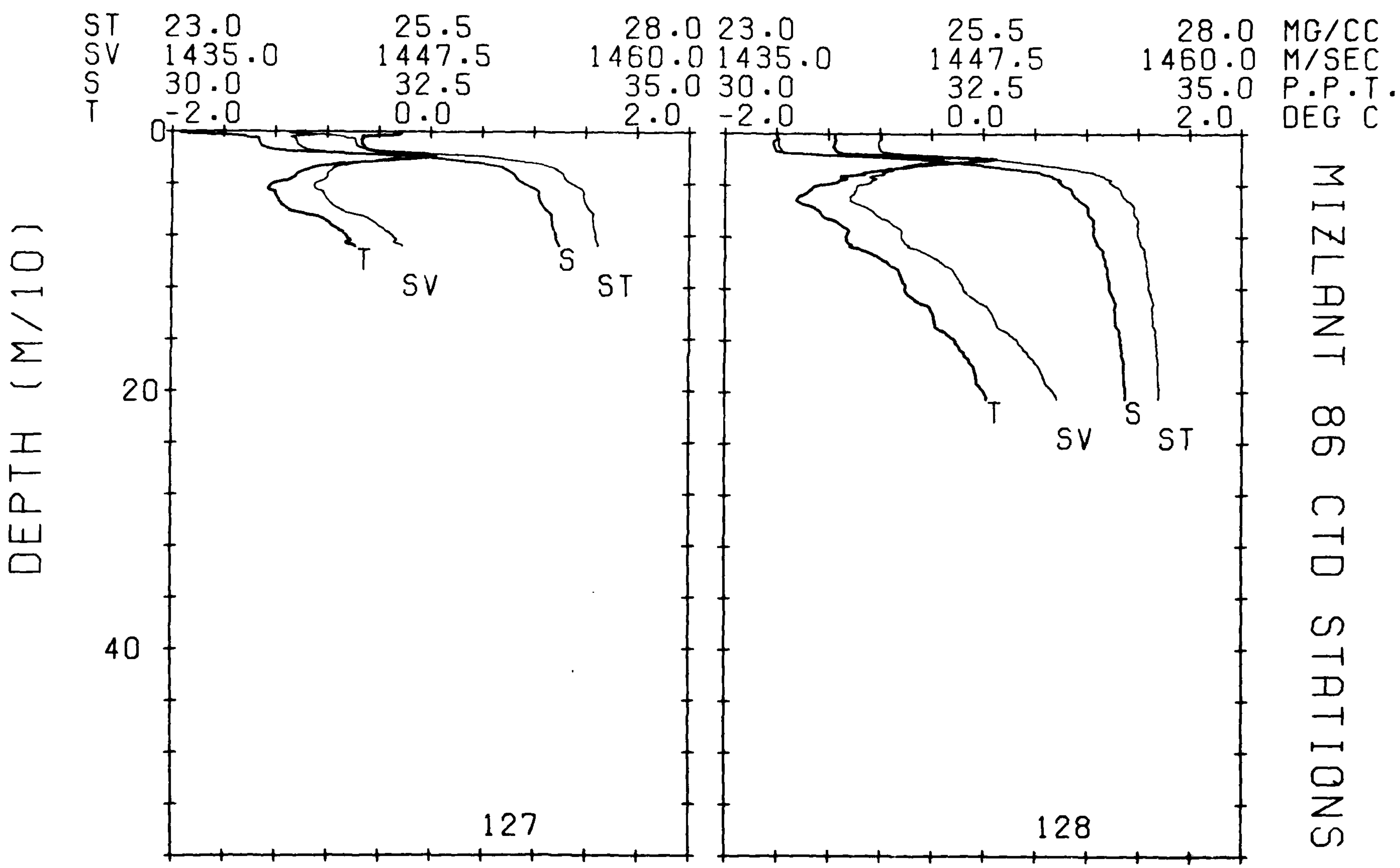
125A
ST
S
SV
T
0
20
40
DEPTH (M/10)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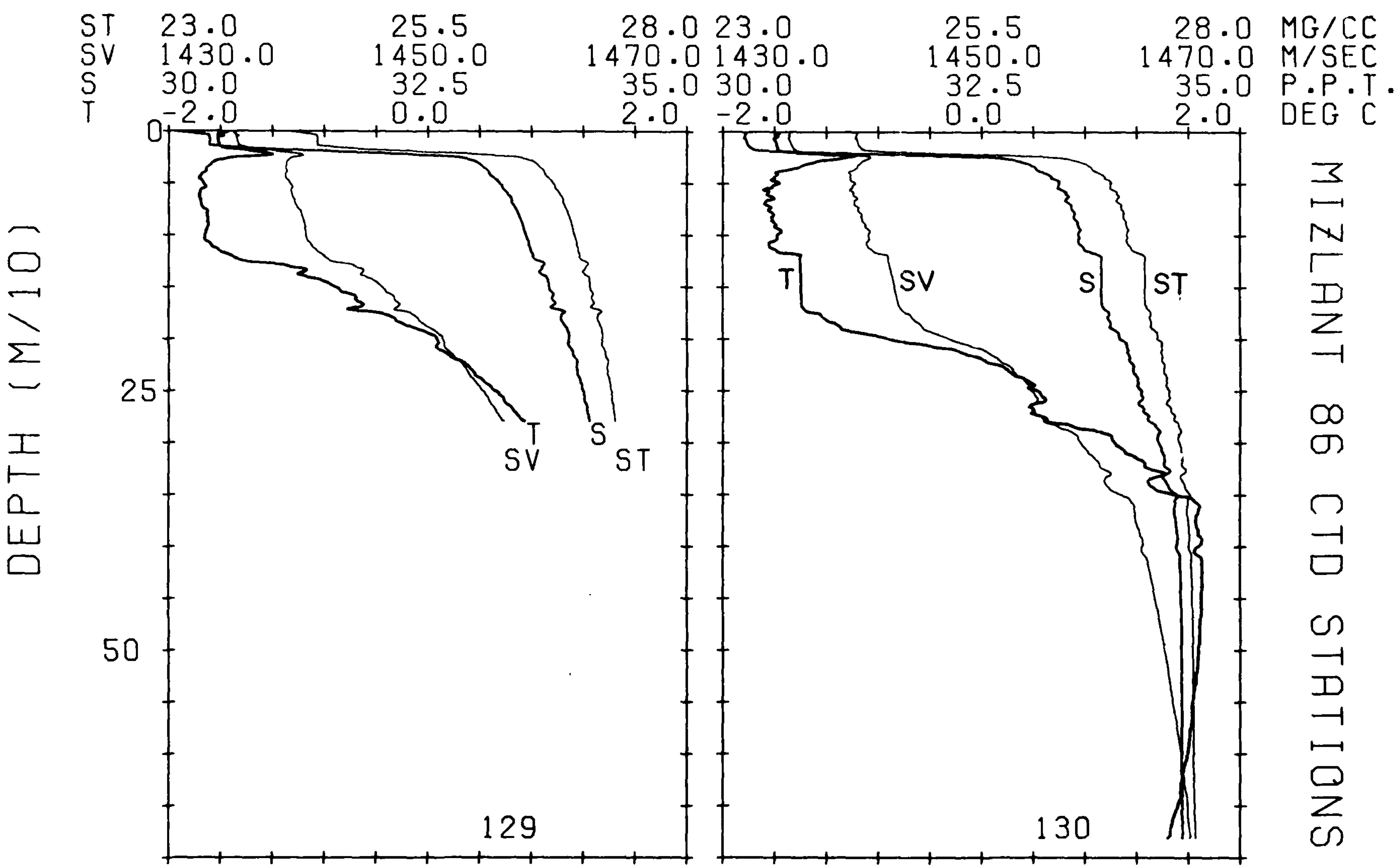

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50
T
SV
S
ST
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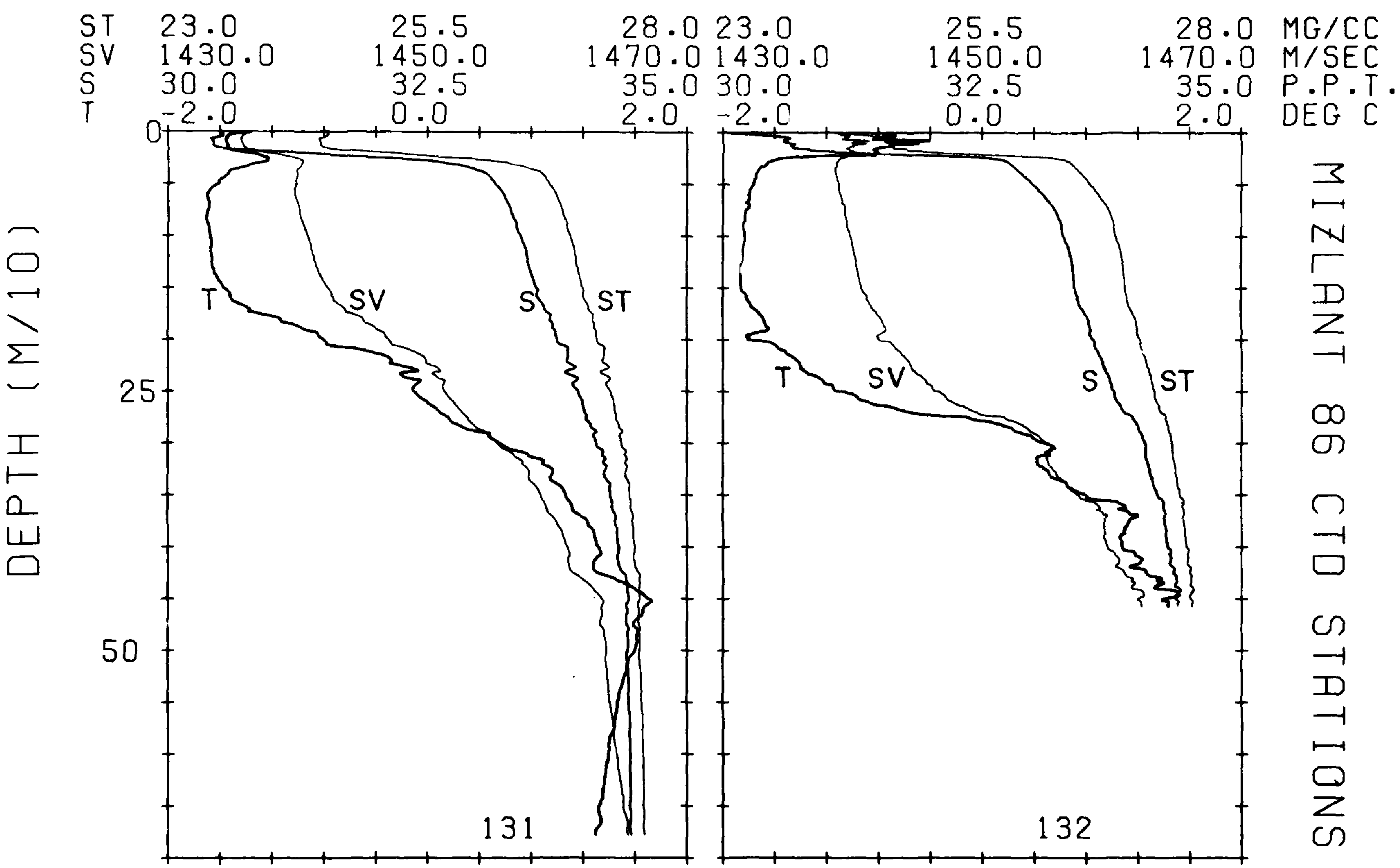
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28.0 1470.0 35.0 2.0
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DEPTH (M/10)
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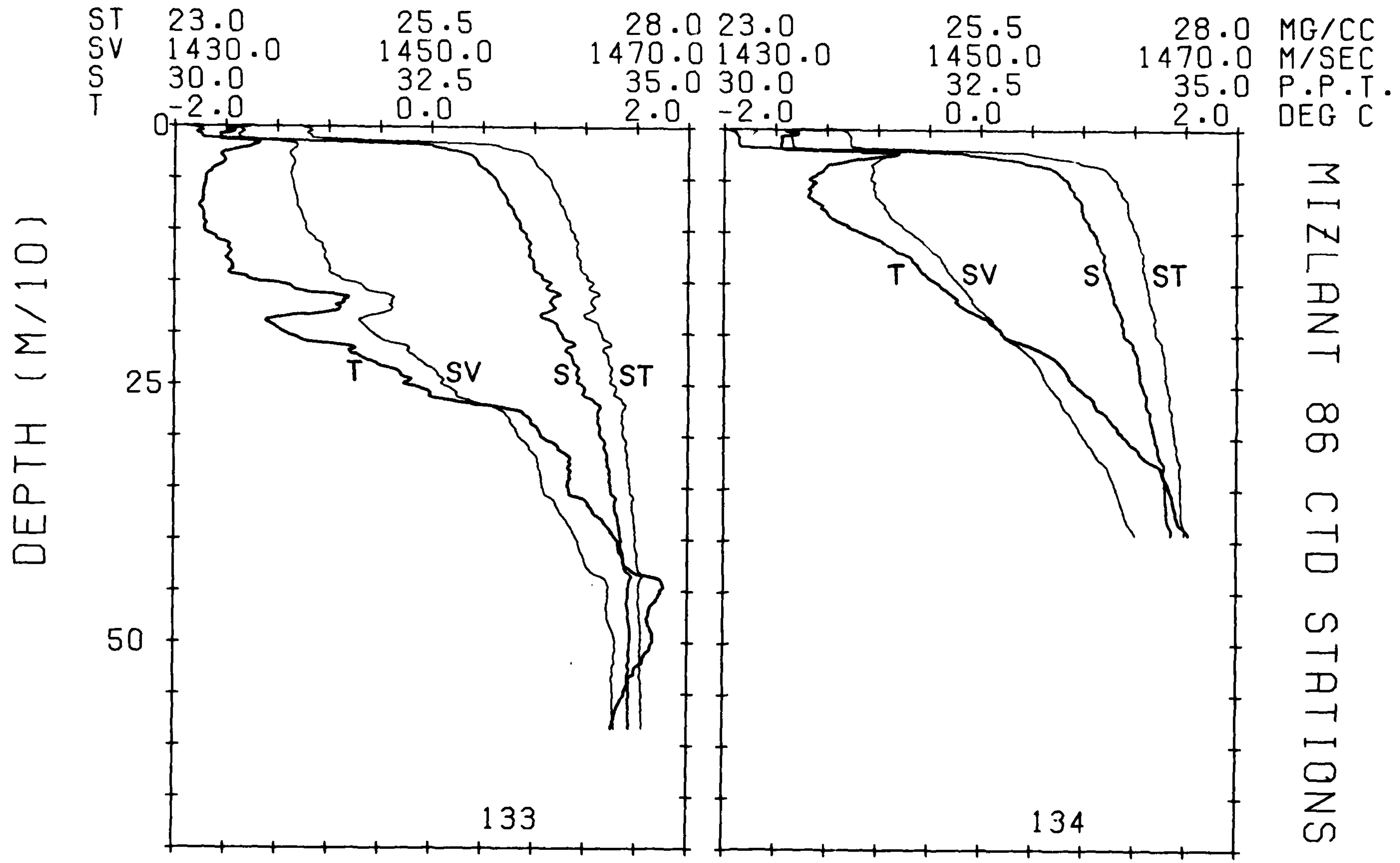
25
50
T
SV
S
ST
131
132



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25
50
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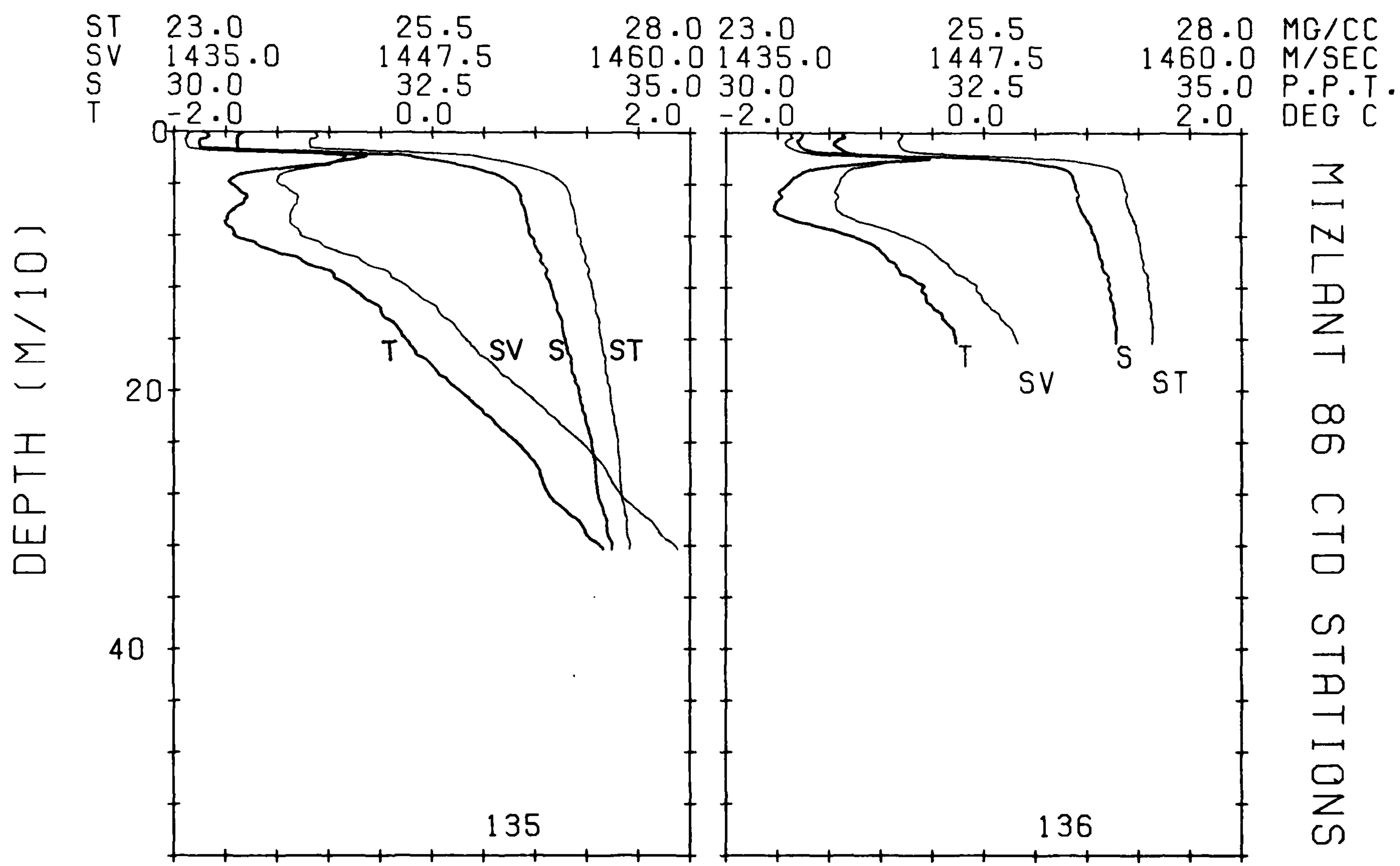
133
134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SV
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32.5
0.0
28.0
1460.0
35.0
2.0
MG/CC
M/SEC
P.P.T.
DEG C
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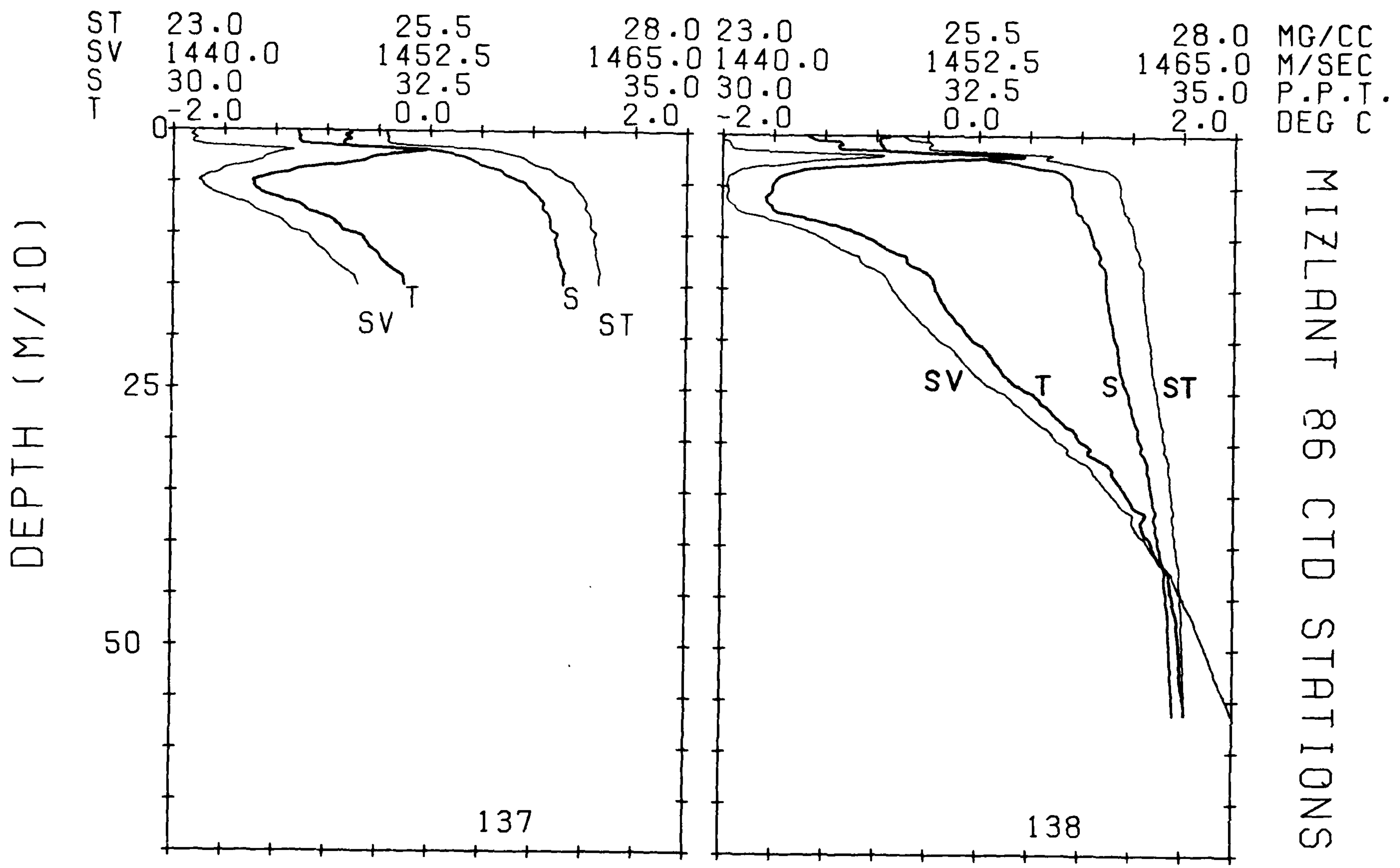
20
40
T
SV
S
ST
135
136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DEPTH (M/10)
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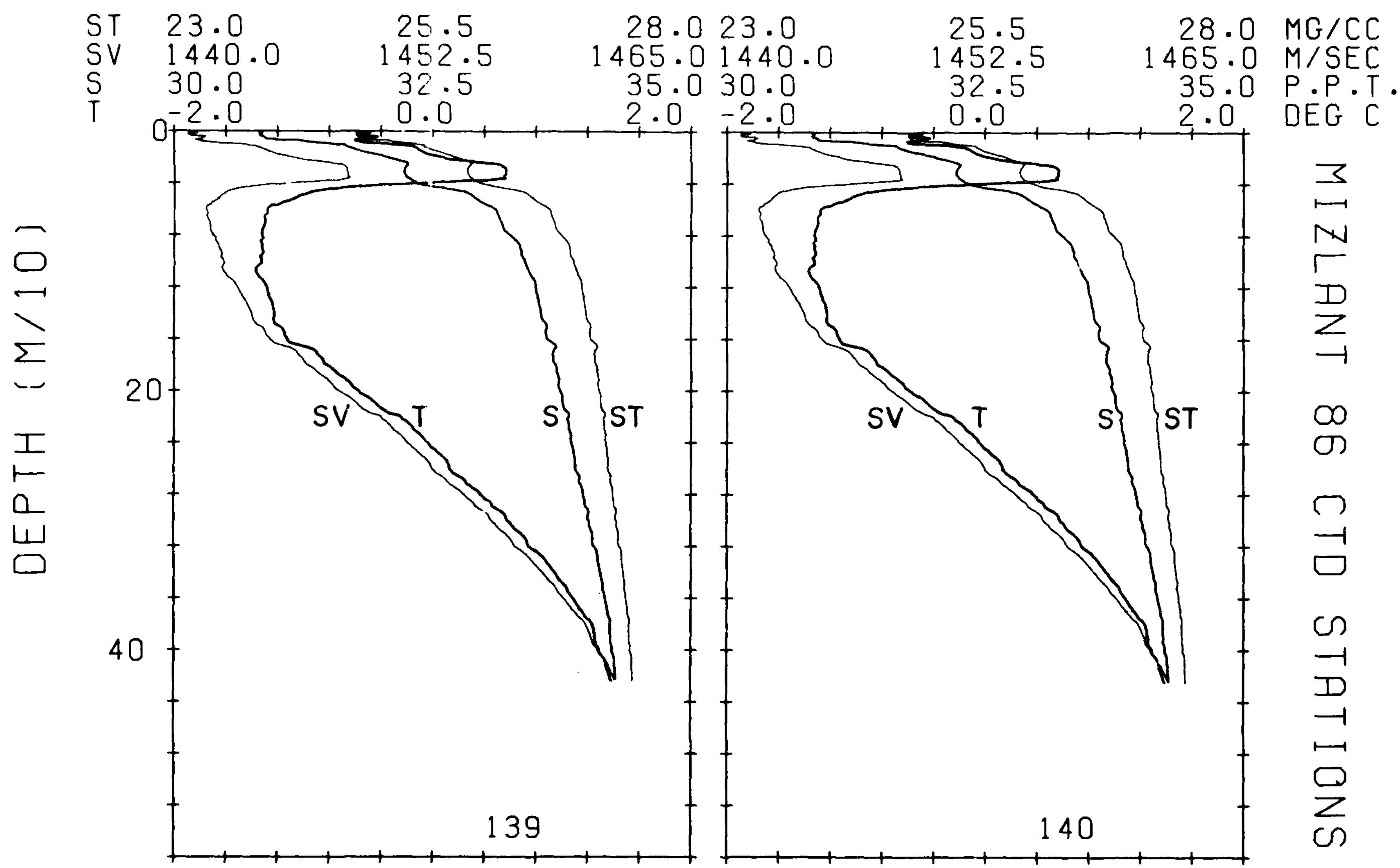
25
50
SV
T
S
ST
137
138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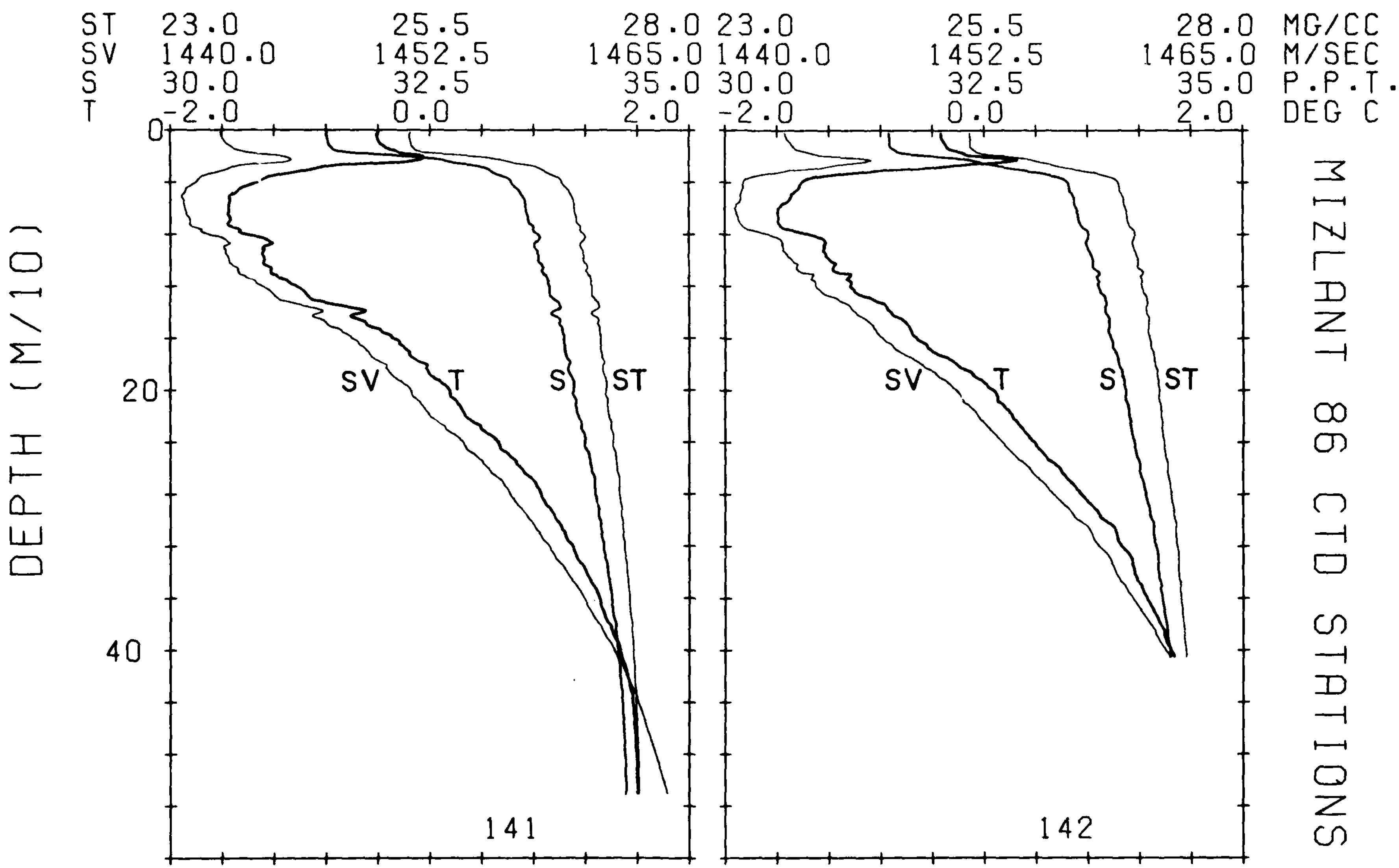
S 30.0 32.5 35.0 30.0 32.5 35.0 P.P.T.
T -2.0 0.0 2.0 -2.0 0.0 2.0 DEG C
0
20
40
DEPTH (M/10)
SV
T
S
ST
139
SV
T
S
ST
140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S 30.0 32.5 35.0 30.0 32.5 35.0 P.P.T.
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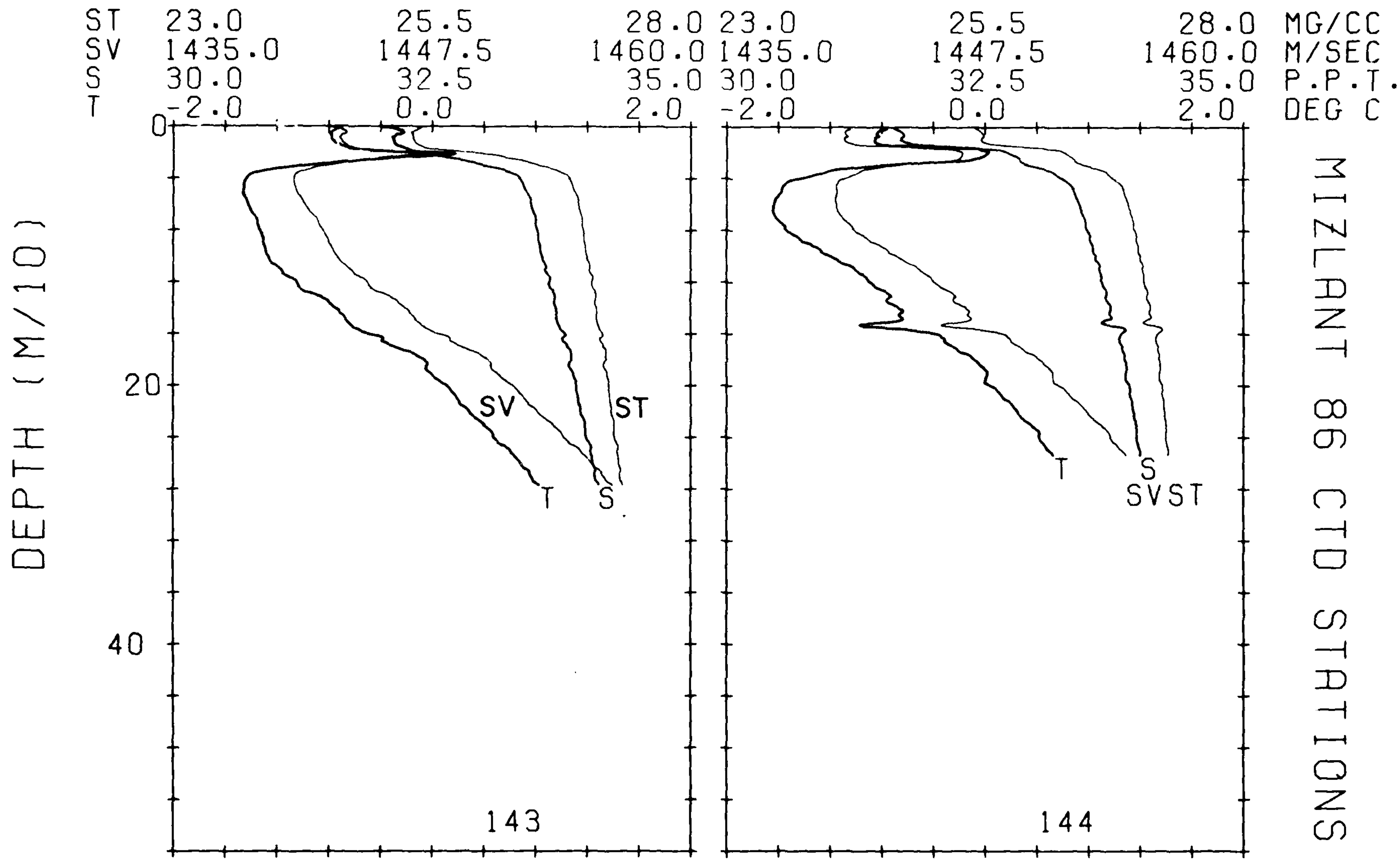
40
SV
T
S
ST
141
142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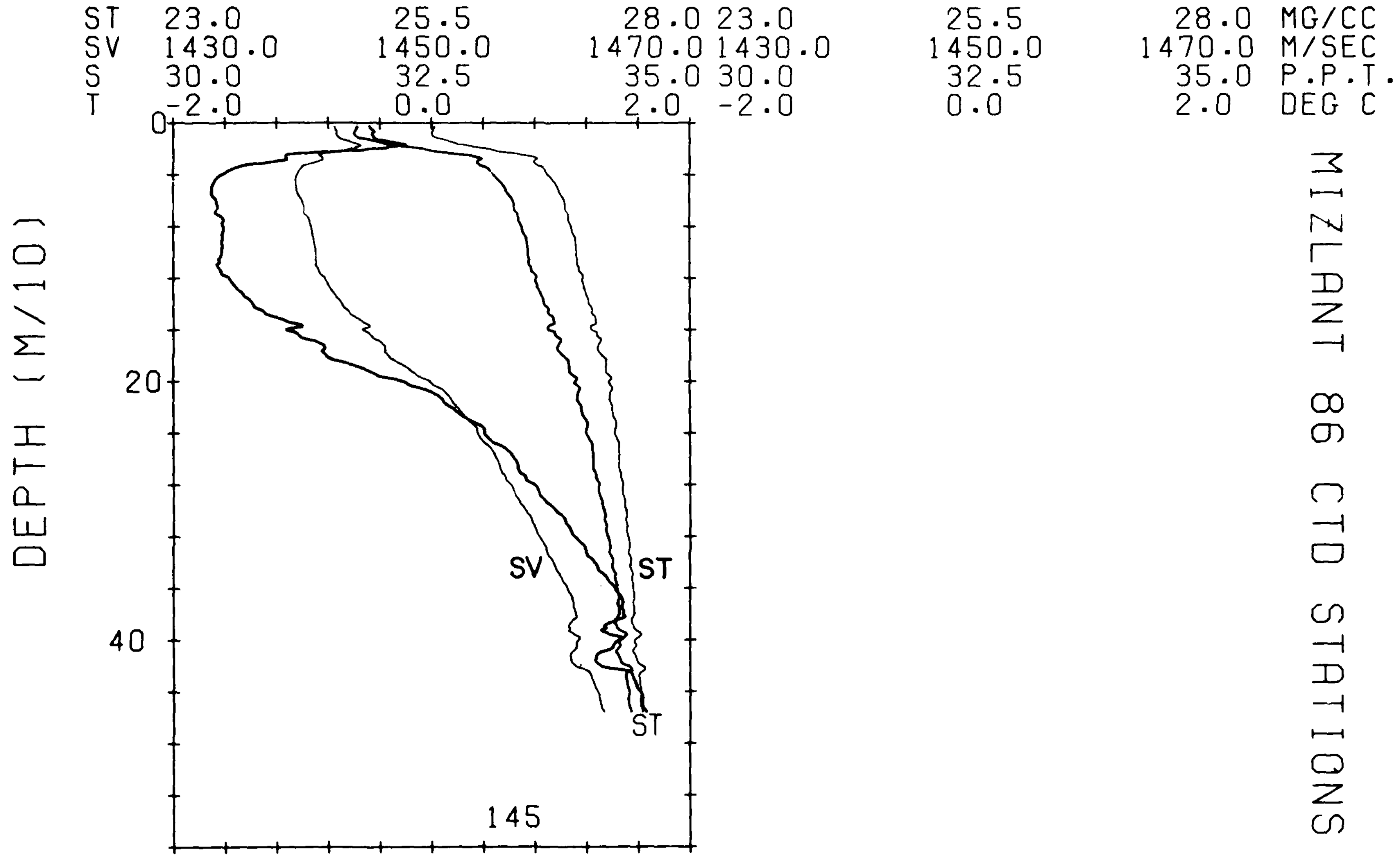
S 30.0 32.5 35.0 30.0 32.5 35.0 P.P.T.
T -2.0 0.0 2.0 -2.0 0.0 2.0 DEG C
DEPTH (M/10)
0
20
40
SV
ST
T
S
143
144
SVST



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